KALI LINUX
DOCUMENTATION

Documenting all the Things

Kali Linux is constantly evolving with new features being added to the distribution all the time. In an ongoing effort, we are attempting to document common, new, or interesting features available in Kali Linux as best as we can. This has prompted the setup of our Official Kali Linux Documentation website. We believe the fastest way to get to know Kali Linux is to follow the documentation site and explore the new features available. On our multi-language documentation site, you will find out\ what makes Kali Linux different from standard Linux distributions, how to install Kali on different types of hardware including ARM devices, how to create your own custom Kali Linux ISOs, and much more. The documentation site is in a constant state of work in progress and is is translated by Kali Linux community members in their free time, on a best-effort basis. As such, translated documents may fall behind the original English translations. If in doubt of accuracy, know that the English versions are the most up-to-date. If you would like to help with translations, contact us.

OFFICIAL DOCUMENTATION

Kali Linux: Professional Penetration-Testing Distro

01. Introduction to Kali Linux

•02. Kali Linux Live
•03. Installing Kali Linux
•04. Kali Linux on ARM
•05. Kali Linux General Use
•06. Customizing Kali Linux
•07. Kali Community Support
•08. Kali Linux Policies
•09. Open Kali Linux Dojo

Contents:

01. Getting Started(4)

•What is Kali Linux ?

•Should I Use Kali Linux?

•Downloading Kali Linux

•Kali Linux Default Passwords

02. Kali Linux Live(3)

•Making a Kali Bootable USB Drive

•Kali Linux Live USB Persistence

•Live Build a Custom Kali ISO

03. Installing Kali Linux(9)

•Kali Linux Hard Disk Install

•Dual Boot Kali with Windows

•Dual Boot Kali on Mac Hardware

•Single Boot Kali on Mac Hardware

•Kali Linux Encrypted Disk Install

•Kali Linux Mini ISO Install

•Kali Linux Network PXE Install

•Troubleshooting Installations

•Troubleshooting Wireless Drivers

04. Kali Linux on ARM(20)

•Kali Linux – ASUS Chromebook Flip

•Kali Linux – MiniX

•Kali Linux – Cubietruck

•Kali Linux – Raspberry Pi2

•Kali Linux – Trimslice

•Kali Linux – Cubieboard2

•Kali Linux – RIoTboard

•Kali Linux – NanoPi2

•Kali Linux – Utilite Pro

•Kali Linux – ODROID-C1

•Kali Linux on USB Armory

•Kali Linux on Acer Tegra Chromebook 13″

•Kali Linux on ODROID-XU3

•Kali Linux – CuBox-i4Pro

•Kali Linux – Samsung Chromebook 2

05. Using Kali Linux(6)

•Kali sources.list Repositories

•Kali Linux Forensics Mode

•Metasploit Framework

•Install NVIDIA GPU Drivers on Kali Linux

•Kali Linux VirtualBox Guest
•VMware Tools in a Kali Guest

06. Customizing Kali Linux(5)

•Rebuilding a Source Package
•Live Build a Custom Kali ISO
•Recompiling the Kali Linux Kernel
•ARM Cross-Compilation
•Preparing a Kali Linux ARM chroot

07. Kali Community Support(5)

•Submitting Bugs for Kali Linux
•Kali Linux Community Forums
•Kali Linux IRC Channel
•Official Kali Linux Sites
•Official Kali Linux Mirrors

08. Kali Linux Policies(7)

•Kali Linux Root User Policy
•Kali Network Service Policies
•Kali Linux Update Policies
•Penetration Testing Tools Policy
•Kali's Relationship With Debian
•Kali Linux Open Source Policy
•Kali Linux Trademark Policy

09. The Kali Linux Dojo(3)

•02 – Building Custom Kali ISOs
•03 – Kali Linux USB Persistence
•04 – Raspberry Pi Disk Encryption

What is Kali Linux ?

Kali Linux is a Debian-based Linux distribution aimed at advanced Penetration Testing and Security Auditing. Kali contains several hundred tools which are geared towards various information security tasks, such as Penetration Testing, Security research, Computer Forensics and Reverse Engineering. Kali Linux is developed, funded and maintained by Offensive Security, a leading information security training company.

Kali Linux was released on the 13th March, 2013 as a complete, top-to-bottom rebuild of BackTrack Linux, adhering completely to Debian development standards.

- **More than 600 penetration testing tools included:** After reviewing every tool that was included in BackTrack, we eliminated a great number of tools that either simply did not work or which duplicated other tools that provided the same or similar functionality. Details on what's included are on the Kali Tools site.
- **Free (as in beer) and always will be:** Kali Linux, like BackTrack, is completely free of charge and always will be. You will never, ever have to pay for Kali Linux.
- **Open source Git tree:** We are committed to the open source development model and our development tree is available for all to see. All of the source code which goes into Kali Linux is available for anyone who wants to tweak or rebuild packages to suit their specific needs.
- **FHS compliant:** Kali adheres to the Filesystem Hierarchy Standard, allowing Linux users to easily locate binaries, support files, libraries, etc.
- **Wide-ranging wireless device support:** A regular sticking point with Linux distributions has been supported for wireless interfaces. We have built Kali Linux to support as many wireless devices as we possibly can, allowing it to run properly on a wide variety of hardware and making it compatible with numerous USB and other wireless devices.
- **Custom kernel, patched for injection:** As penetration testers, the development team often needs to do wireless assessments, so our kernel has the latest injection patches included.
- **Developed in a secure environment:** The Kali Linux team is made up of a small group of individuals who are the only ones trusted to commit packages and interact with the repositories, all of which is done using multiple secure protocols.
- **GPG signed packages and repositories:** Every package in Kali Linux is signed by each individual developer who built and committed it, and the repositories subsequently sign the packages as well.

- **Multi-language support:** Although penetration tools tend to be written in English, we have ensured that Kali includes true multilingual support, allowing more users to operate in their native language and locate the tools they need for the job.
- **Completely customizable:** We thoroughly understand that not everyone will agree with our design decisions, so we have made it as easy as possible for our more adventurous users to customize Kali Linux to their liking, all the way down to the kernel.
- **ARMEL and ARMHF support:** Since ARM-based single-board systems like the Raspberry Pi and BeagleBone Black, among others, are becoming more and more prevalent and inexpensive, we knew that Kali's ARM support would need to be as robust as we could manage, with fully working installations for both ARMEL and ARMHF systems. Kali Linux is available on a wide range of ARM devices and has ARM repositories integrated with the mainline distribution so tools for ARM are updated in conjunction with the rest of the distribution.

Kali Linux is specifically tailored to the needs of penetration testing professionals, and therefore all documentation on this site assumes prior knowledge of, and familiarity with, the Linux operating system in general. Please see Should I Use Kali Linux? for more details on what makes Kali unique.

Should I Use Kali Linux?

What's Different About Kali Linux?

Kali Linux is specifically geared to meet the requirements of professional penetration testing and security auditing. To achieve this, several core changes have been implemented in Kali Linux which reflect these needs:

1. **Single user, root access by design:** Due to the nature of security audits, Kali Linux is designed to be used in a "single, root user" scenario. Many of the tools used in penetration testing require escalated privileges, and while it's generally sound policy to only enable root privileges when necessary, in the use cases that Kali Linux is aimed at, this approach would be a burden.

2. **Network services disabled by default:** Kali Linux contains systemd hooks that disable network services by default. These hooks allow us to install various services on Kali Linux, while ensuring that our distribution remains secure by default, no matter what

packages are installed. Additional services such as Bluetooth are also blacklisted by default.

3. **Custom Linux kernel:** Kali Linux uses an upstream kernel, patched for wireless injection.

4. **A *minimal* and *trusted* set of repositories:** given the aims and goals of Kali Linux, maintaining the integrity of the system as a whole is absolutely key. With that goal in mind, the set of upstream software sources which Kali uses is kept to an absolute minimum. Many new Kali users are tempted to add additional repositories to their **sources.list**, but doing so runs a *very serious risk* of breaking your Kali Linux installation.

Is Kali Linux Right For You?

As the distribution's developers, you might expect us to recommend that everyone should be using Kali Linux. The fact of the matter is, however, that Kali is a Linux distribution specifically geared towards professional penetration testers and security specialists, and given its unique nature, it is **NOT** a recommended distribution if you're unfamiliar with Linux or are looking for a general-purpose Linux desktop distribution for development, web design, gaming, etc.

Even for experienced Linux users, Kali can pose some challenges. Although Kali is an open source project, it's not a *wide*-open source project, for reasons of security. The development team is small and trusted, packages in the repositories are signed both by the individual committer and the team, and — importantly — the set of upstream repositories from which updates and new packages are drawn is very small. Adding repositories to your software sources which have not been tested by the Kali Linux development team is a good way to cause problems on your system.

While Kali Linux is architected to be highly customizable, don't expect to be able to add random unrelated packages and repositories that are "out of band" of the regular Kali software sources and have it Just Work. In particular, there is absolutely no support whatsoever for the apt-add-repository command, LaunchPad, or PPAs. Trying to install ***Steam***on your Kali Linux desktop is an experiment that will not end well. Even getting a package as mainstream as NodeJS onto a Kali Linux installation can take a little extra effort and tinkering.

If you are unfamiliar with Linux generally, if you do not have at least a basic level of competence in administering a system, if you are looking for a Linux distribution to use as a learning tool to get to know your way around Linux, or if you want a distro that you can use as a general purpose desktop installation, *Kali Linux is probably not what you are looking for*.

In addition, misuse of security and penetration testing tools within a network, particularly without specific authorization, may cause irreparable damage and result in significant consequences, personal and/or legal. “Not understanding what you were doing” is not going to work as an excuse.

However, if you’re a professional penetration tester or are studying penetration testing with a goal of becoming a certified professional, there’s no better toolkit — at any price — than Kali Linux.

If you are looking for a Linux distribution to learn the basics of Linux and need a good starting point, Kali Linux is ***not*** the ideal distribution for you. You may want to begin with Ubuntu, Mint, or Debian instead. If you’re interested in getting hands-on with the internals of Linux, take a look the “Linux From Scratch” project.

Downloading Kali Linux

/01. Getting Started /Downloading Kali Linux

• 01. Getting Started

IMPORTANT! ***Never*** download Kali Linux images from *anywhere other than the official sources*. ***Always*** be sure to *verify the SHA256 checksums of the file you’ve downloaded against our official values*. It would be easy for a malicious entity to modify a Kali installation to contain exploits or malware and host it unofficially.

Where to Get Official Kali Linux Images

ISO Files for Intel-based PCs

In order to run Kali “Live” from a USB drive on standard Windows and Apple PCs, you’ll need a Kali Linux bootable ISO image, in either 32-bit or 64-bit format.

If you’re not sure of the architecture of the system you want to run Kali on, on Linux or OS X, you can run the command

```
uname -m
```

at the command line. If you get the response, “x86_64”, use the 64-bit ISO image (the one containing “amd64” in the file name); if you get “i386”, use the 32-bit image (the one containing “i386” in the file name). If you’re on a Windows system, the procedure for determining whether your architecture is detailed on Microsoft’s website.

The Kali Linux images are available both as directly downloadable ".iso/.img" files or via ".torrent" files.

- Official Kali ISOs for Intel-based PCs

Building your own Kali Linux ISO, standard or customized, is a very simple process.

VMware Images

If you want to run Kali Linux as a "guest" under VMware, Kali is available as a pre-built VMware virtual machine with VMware Tools already installed. The VMware image is available in a 64-bit (amd64), 32-bit (i686), and 32-bit PAE (i486) formats.

- Official Kali Linux VMware Images

ARM Images

The hardware architectures of ARM-based devices vary considerably, so it is not possible to have a single image that will work across all of them. Pre-built Kali Linux images for the ARM architecture are available for the wide range of devices.

Scripts for building your own ARM images locally are also available on GitHub. For more details see the articles on setting up an ARM cross-compilation environment, and building a custom Kali Linux ARM chroot.

Verifying Your Downloaded Kali Image

Why do I need to do this?

Before you run Kali Linux Live, or install it to your hard disk, you want to be very sure that what you've got actually *is* Kali Linux, and not an imposter. Kali Linux is a professional penetration testing and forensics toolkit. As a professional penetration tester, having absolute confidence in the integrity of your tools is critical: if your tools aren't trustworthy, your investigations won't be trustworthy, either.

Moreover, as the leading penetration testing distribution, Kali's strengths mean that a bogus version of Kali Linux could do *a tremendous amount of damage* if it were deployed unwittingly. There are plenty of people with plenty of reason to want to stick very sketchy stuff into something that *looks* like Kali, and you absolutely don't want to find yourself running something like that.

Avoiding this is simple:

- *only* download Kali Linux via the official download pages at https://www.kali.org/downloads or https://www.offensive-security.com/kali-linux-vmware-arm-image-download/ — you won't be able to browse to these pages without SSL: encrypting the connection makes it much harder for an attacker to use a "man-in-the-middle" attack to modify your download. There are a few potential weaknesses to even these sources — see the sections on verifying the download with the SHA256SUMS file and its signature against the official Kali Development team private key for something much closer to absolute assurance.
- once you've downloaded an image, and *before you run it*, *always* validate that it really *is* what it's supposed to be by verifying its checksum using one of the procedures detailed below.

There are several methods for verifying your download. Each provides a certain level of assurance, and involves a corresponding level of effort on your part.

- You can download an ISO image from an official Kali Linux "Downloads" mirror, calculate the ISO's SHA256 hash and compare it by inspection with the value listed on the Kali Linux site. This is quick and easy, but potentially susceptible to subversion via a DNS poisoning: it assumes that the site to which, for example, the domain "kali.org" resolves is in fact the actual Kali Linux site. If it somehow weren't, an attacker could present a "loaded" image and a matching SHA256 signature on the fake web page. See the section "Manually Verify the Signature on the ISO (Direct Download)", below.
- You can download an ISO image through the torrents, and it will also pull down a file — unsigned — containing the calculated SHA256 signature. You can then use the shasum command (on Linux and OS X) or a utility (on Windows) to automatically verify that the file's computed signature matches the signature in the secondary file. This is even easier than the "manual" method, but suffers from the same weakness: if the torrent you pulled down isn't really Kali Linux, it could still have a good signature. See the section "Verify the Signature on the ISO Using the Included Signature File (Torrent Download)", below.
- To be as close to absolutely certain as possible that the Kali Linux download you've obtained is the real thing, you can download both a cleartext signature file and and version of the same file that has been signed with the official Kali Linux private key and use GNU Privacy Guard (GPG) to first, verify that the computed SHA256 signature and the signature in the cleartext file match and second, verify that the signed version of the file containing the SHA256 hash has been correctly signed with the official key.
If you use this more complicated process and successfully validate your downloaded ISO, you can proceed with pretty complete assurance that what you've got is the official image

and that it has not been tampered with in any way. This method, while the most complex, has the advantage of providing independent assurance of the integrity of the image. The only way this method can fail is if the official Kali Linux private key is not only subverted by an attacker, but also not subsequently revoked by the Kali Linux development team. For this method, see the section on verification using the SHA256SUMS file.

What do I need to do this?

If you're running on Linux, you probably already have GPG (GNU Privacy Guard) installed. If you're on Windows or OS X, you'll need to install the appropriate version for your platform.

- If you're on a PC running Windows, download and install GPG4Win from here.
- If you're on a Macintosh running OS X, download and install GPGTools from here. Since Windows does not have the native ability to calculate SHA256 checksums, you will also need a utility such as Microsoft File Checksum Integrity Verifier or Hashtab to verify your download.

Once you've installed GPG, you'll need to download and import a copy of the Kali Linux official key. Do this with the following command:

```
$ wget -q -O - https://www.kali.org/archive-key.asc | gpg --import
```

or the command

```
$ gpg --keyserver hkp://keys.gnupg.net --recv-key 7D8D0BF6
```

Your output should look like this:

```
gpg: key 7D8D0BF6: public key "Kali Linux Repository <devel@kali.org>" imported
gpg: Total number processed: 1
gpg:               imported: 1  (RSA: 1)
```

Verify that the key is properly installed with the command:

```
gpg --fingerprint 7D8D0BF6
```

The output will look like this:

```
pub   rsa4096 2012-03-05 [SC] [expires: 2021-02-03]
      44C6 513A 8E4F B3D3 0875  F758 ED44 4FF0 7D8D 0BF6
uid           [  full  ] Kali Linux Repository <devel@kali.org>
sub   rsa4096 2012-03-05 [E] [expires: 2021-02-03]
```

You're now set up to validate your Kali Linux download.

How Do I Verify My Downloaded Image?

Manually Verify the Signature on the ISO (Direct Download)

If you downloaded the ISO directly from the downloads page, verify it using the following procedure.

On Linux, or OS X, you can generate the SHA256 checksum from the ISO image you've downloaded with the following command (assuming that the ISO image is named "kali-linux-2016.2-amd64.iso", and is in your current directory):

```
shasum -a 256 kali-linux-2016.2-amd64.iso
```

The output should look like this:

```
1d90432e6d5c6f40dfe9589d9d0450a53b0add9a55f71371d601a5d454fa0431  kali-linux-2016.2-amd64.iso
```

The resulting SHA256 signature, "1d90432e6d5c6f40dfe9589d9d0450a53b0add9a55f71371d601a5d454fa0431", can be seen to match the signature displayed in the "sha256sum" column on the official download page for the 64-bit Intel architecture Kali Linux 2016.2 ISO image:

Download Kali Linux Images

We generate fresh Kali Linux image files every few months, which we make available for download. This page provides the links to **download Kali Linux** in its latest official release. For a release history, check our Kali Linux Releases page. Please note: You can find unofficial, untested weekly releases at http://cdimage.kali.org/kali-weekly/.

Image Name	Download	Size	Version	sha256sum
Kali 64 bit	ISO | Torrent	2.9G	2016.2	1d90432e6d5c6f40dfe9589d9d0450a53b0add9a55f71371d601a5d454fa0431
Kali 32 bit	ISO | Torrent	2.9G	2016.2	c94772c4fd71f50b245c7b15f4f225ad7c751879f501fa1cf698beb1460c0bf5
Kali 64 bit Light	ISO | Torrent	1.1G	2016.2	997f5ed0f7c99c4518288c7e2c4b684b1bdcc2fbe02c152d7ecbd17f0536c29f
Kali 32 bit Light	ISO | Torrent	1.1G	2016.2	590e6df2e8e0b4d42bf3dd4e4c7d6acf24b7262fabda52a0c6c3b35006def295
Kali 64 bit e17	ISO | Torrent	2.7G	2016.2	404d0fd917a404cf6c894b5bd87171ebf8eb445bd5573a3e78f88629067d694b
Kali 64 bit Mate	ISO | Torrent	2.8G	2016.2	cd11b7085cc7d7154648810 6c2eedf85386fe73d731bedf38991661270dd91db
Kali 64 bit Xfce	ISO | Torrent	2.7G	2016.2	3e08e5420b368183606b105cf2cb1276dd024afe3e2b2e3187d7d37ec1320c41
Kali 64 bit LXDE	ISO | Torrent	2.7G	2016.2	7461882843e5a0fc37979850994fb5755249a176429f9e67805bd7f6baa5bb62
Kali armhf	Image | Torrent	0.7G	2016.2	f192289b6bc64bab7197a90627ced2477c7c98bd20c1d29f442a152e169dae42
Kali armel	Image | Torrent	0.7G	2016.2	efb6f487feab1c9141f28da22c73cbc5217325bf46298f899ac89c39c19aa5f5

Verify the Signature on the ISO Using the Included Signature File (Torrent Download)

If you downloaded your copy of the Kali Linux ISO image via the torrents, in addition to the ISO file (e.g. kali-linux-2016.2-amd64.iso), there will be a second file containing the computed SHA256 signature for the ISO, with the extension ".txt.sha256sum" (e.g. kali-linux-2016.2-amd64.txt.sha256sum). You can use this file to verify the authenticity of your download on Linux or OS X with the following command:

```
grep kali-linux-2016.2-amd64.iso kali-linux-2016.2-amd64.txt.sha256sum | shasum -a 256 -c
```

If the image is successfully authenticated, the response will look like this:

```
kali-linux-2016.2-amd64.iso: OK
```

IMPORTANT! If you are unable to verify the authenticity of the Kali Linux image you have downloaded as described in the preceding section, ***do NOT use it!*** **Using it could endanger not only your own system, but any network you connect to as well as the other systems on that network.** ***Stop***, and ***ensure*** that you have downloaded the images from a ***legitimate Kali Linux mirror***.

Verify the ISO Using the SHA256SUMS File

This is a more complex procedure, but offers a much higher level of validation: it does not rely on the integrity of the web site you downloaded the image from, only the official Kali Linux development team key that you install independently. To verify your image this way for an Intel architecture version of Kali, you will need to download three files from the Kali "Live CD Image" site for the current release (v2016.2, as of this writing):

- The ISO image itself (e.g. kali-linux-2016.2-amd64.iso)
- The file containing the calculated SHA256 hash for the ISO, SHA256SUMS
- The signed version of that file, SHA256SUMS.gpg

Before verifying the checksums of the image, you must ensure that the SHA256SUMS file is the one generated by Kali. That's why the file is signed by Kali's official key with a detached signature in SHA256SUMS.gpg. If you have not already done so, Kali's official key can be downloaded and imported into your keychain with this command:

```
$ wget -q -O - https://www.kali.org/archive-key.asc | gpg --import
```

or this command

```
$ gpg --keyserver hkp://keys.gnupg.net --recv-key 7D8D0BF6
```

Your output should look like this:

```
gpg: key 7D8D0BF6: public key "Kali Linux Repository <devel@kali.org>" imported
gpg: Total number processed: 1
gpg:               imported: 1  (RSA: 1)
```

You should verify that the key is properly installed with the command:

```
gpg --fingerprint 7D8D0BF6
```

The output will look like this:

```
pub   rsa4096 2012-03-05 [SC] [expires: 2021-02-03]
      44C6 513A 8E4F B3D3 0875  F758 ED44 4FF0 7D8D 0BF6
uid           [  full  ] Kali Linux Repository <devel@kali.org>
sub   rsa4096 2012-03-05 [E] [expires: 2021-02-03]
```

Once you have downloaded both SHA256SUMS and SHA256SUMS.gpg, you can verify the signature as follows:

```
$ gpg --verify SHA256SUMS.gpg SHA256SUMS
gpg: Signature made Thu 16 Mar 08:55:45 2017 MDT using RSA key ID 7D8D0BF6
gpg: Good signature from "Kali Linux Repository <devel@kali.org>"
```

If you don't get that "Good signature" message or if the key ID doesn't match, then you should *stop* and review whether you downloaded the images from a *legitimate Kali Linux mirror*. The failed verification strongly suggests that the image you have may have been tampered with.

If you did get the "Good signature" response, you can now be assured that the checksum in the SHA256SUMS file was actually provided by the Kali Linux development team. All that remains to be done to complete the verification is to validate that the signature you compute from the ISO you've downloaded matches the one in the SHA256SUMS file. You can do that on Linux or OS X with the following command (assuming that the ISO is named "kali-linux-2016.2-amd64.iso" and is in your working directory):

```
grep kali-linux-2016.2-amd64.iso SHA256SUMS | shasum -a 256 -c
```

If the image is successfully authenticated, the response will look like this:

```
kali-linux-2016.2-amd64.iso: OK
```

If you don't get "OK" in response, then *stop* and review what's happened: the Kali image you have has apparently been tampered with. Do **NOT** use it.

Once you've downloaded and verified your image, you can proceed to create a bootable "Kali Linux Live" USB drive.

Kali Linux Default Passwords

/01. Getting Started /Kali Linux Default Passwords

• 01. Getting Started

Kali Linux Default root Password is toor

Default root Password

During installation, Kali Linux allows users to configure a password for the *root* user. However, should you decide to boot the live image instead, the i386, amd64, VMWare and ARM images are configured with the **default root password – "toor"**, without the quotes.

Making a Kali Bootable USB Drive

/02. Kali Linux Live /Making a Kali Bootable USB Drive

• 02. Kali Linux Live

Our favorite way, and the fastest method, for getting up and running with Kali Linux is to run it "live" from a USB drive. This method has several advantages:

- It's non-destructive — it makes no changes to the host system's hard drive or installed OS, and to go back to normal operations, you simply remove the "Kali Live" USB drive and restart the system.
- It's portable — you can carry Kali Linux in your pocket and have it running in minutes on an available system
- It's customizable — you can roll your own custom Kali Linux ISO image and put it onto a USB drive using the same procedures
- It's potentially persistent — with a bit of extra effort, you can configure your Kali Linux "live" USB drive to have persistent storage, so the data you collect is saved across reboots

In order to do this, we first need to create a bootable USB drive which has been set up from an ISO image of Kali Linux.

What You'll Need

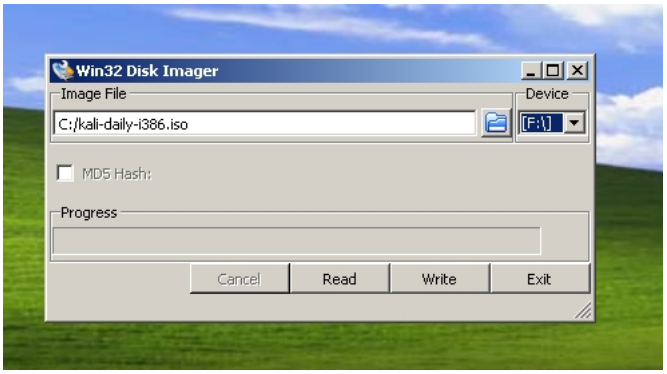
1. A *verified* copy of the appropriate ISO image of the latest Kali build image for the system you'll be running it on: see the details on downloading official Kali Linux images.
2. If you're running under Windows, you'll also need to download the Win32 Disk Imager utility. On Linux and OS X, you can use the **dd** command, which is pre-installed on those platforms.
3. A USB thumb drive, 4GB or larger. (Systems with a direct SD card slot can use an SD card with similar capacity. The procedure is identical.)

Kali Linux Live USB Install Procedure

The specifics of this procedure will vary depending on whether you're doing it on a Windows, Linux, or OS X system.

Creating a Bootable Kali USB Drive on Windows

1. Plug your USB drive into an available USB port on your Windows PC, note which drive designator (e.g. "F:\") it uses once it mounts, and launch the Win32 Disk Imager software you downloaded.
2. Choose the Kali Linux ISO file to be imaged and verify that the USB drive to be overwritten is the correct one. Click the "Write" button.



3. Once the imaging is complete, safely eject the USB drive from the Windows machine. You can now use the USB device to boot into Kali Linux.

Creating a Bootable Kali USB Drive on Linux

Creating a bootable Kali Linux USB key in a Linux environment is easy. Once you've downloaded and verified your Kali ISO file, you can use the **dd** command to copy it over to your USB stick using the following procedure. Note that you'll need to be running as root, or to execute the **dd** command with sudo. The following example assumes a Linux Mint 17.1 desktop — depending on the distro you're using, a few specifics may vary slightly, but the general idea should be very similar.

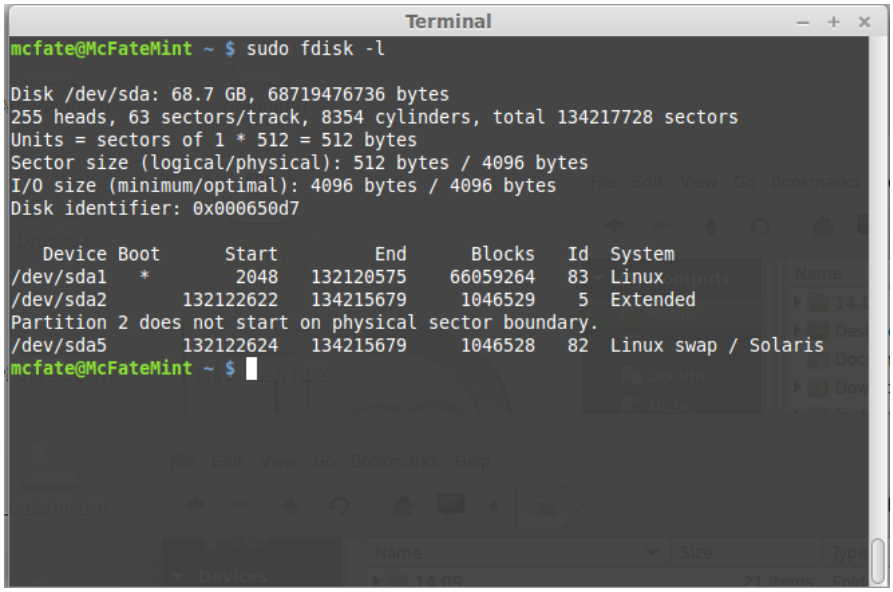
WARNING: Although the process of imaging Kali Linux onto a USB drive is very easy, you can just as easily overwrite a disk drive you didn't intend to with **dd** if you do not understand what you are doing, or if you specify an incorrect output path. Double-check what you're doing ***before*** you do it, it'll be too late afterwards.

Consider yourself warned.

1. First, you'll need to identify the device path to use to write the image to your USB drive. ***Without*** the USB drive inserted into a port, execute the command

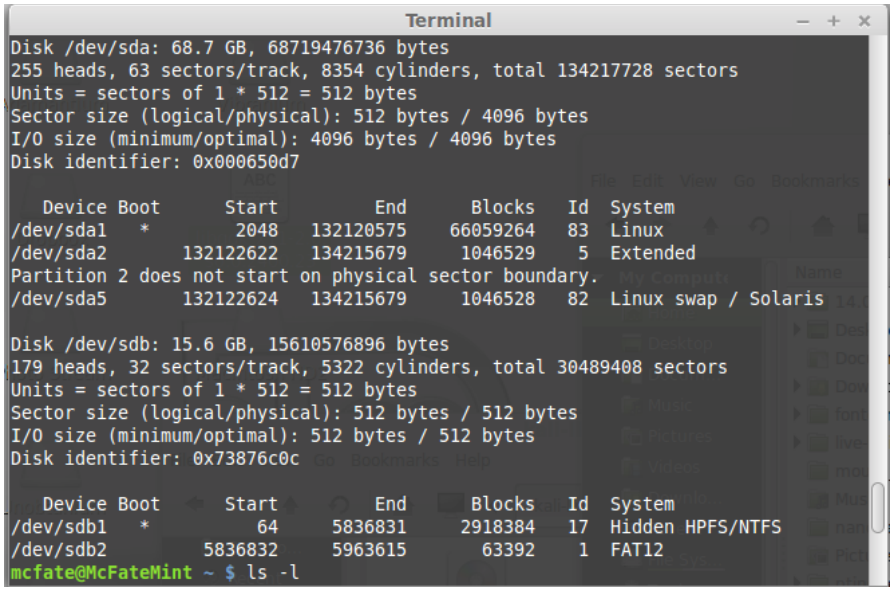
   `sudo fdisk -l`

   at a command prompt in a terminal window (if you don't use elevated privileges with fdisk, you won't get any output). You'll get output that will look something (*not exactly*) like this, showing a single drive — "/dev/sda" — containing three partitions (/dev/sda1, /dev/sda2, and /dev/sda5):


Terminal
mcfate@McFateMint ~ $ sudo fdisk -l
Disk /dev/sda: 68.7 GB, 68719476736 bytes
255 heads, 63 sectors/track, 8354 cylinders, total 134217728 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 4096 bytes
I/O size (minimum/optimal): 4096 bytes / 4096 bytes
Disk identifier: 0x000650d7
Device Boot Start End Blocks Id System
/dev/sda1 * 2048 132120575 66059264 83 Linux
/dev/sda2 132122622 134215679 1046529 5 Extended
Partition 2 does not start on physical sector boundary.
/dev/sda5 132122624 134215679 1046528 82 Linux swap / Solaris
mcfate@McFateMint ~ $

2. Now, plug your USB drive into an available USB port on your system, and run the same command, "sudo fdisk -l" a second time. Now, the output will look something (again, *not*

exactly) like this, showing an additional device which wasn't there previously, in this example "/dev/sdb", a 16GB USB drive:


Terminal
Disk /dev/sda: 68.7 GB, 68719476736 bytes
255 heads, 63 sectors/track, 8354 cylinders, total 134217728 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 4096 bytes
I/O size (minimum/optimal): 4096 bytes / 4096 bytes
Disk identifier: 0x000650d7
Device Boot Start End Blocks Id System
/dev/sda1 * 2048 132120575 66059264 83 Linux
/dev/sda2 132122622 134215679 1046529 5 Extended
Partition 2 does not start on physical sector boundary.
/dev/sda5 132122624 134215679 1046528 82 Linux swap / Solaris
Disk /dev/sdb: 15.6 GB, 15610576896 bytes
179 heads, 32 sectors/track, 5322 cylinders, total 30489408 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x73876c0c
Device Boot Start End Blocks Id System
/dev/sdb1 * 64 5836831 2918384 17 Hidden HPFS/NTFS
/dev/sdb2 5836832 5963615 63392 1 FAT12
mcfate@McFateMint ~ $ ls -l

3. Proceed to (carefully!) image the Kali ISO file on the USB device. The example command below assumes that the ISO image you're writing is named "kali-linux-2017.1-amd64.iso" and is in your current working directory. The blocksize parameter can be increased, and while it may speed up the operation of the dd command, it can occasionally produce unbootable USB drives, depending on your system and a lot of different factors. The recommended value, "bs=512k", is conservative and reliable.

```
dd if=kali-linux-2017.1-amd64.iso of=/dev/sdb bs=512k
```

Imaging the USB drive can take a good amount of time, over ten minutes or more is not unusual, as the sample output below shows. Be patient!

The dd command provides no feedback until it's completed, but if your drive has an access indicator, you'll probably see it flickering from time to time. The time to **dd** the image across will depend on the speed of the system used, USB drive itself, and USB port it's inserted into. Once **dd** has finished imaging the drive, it will output something that looks like this:

```
5823+1 records in
5823+1 records out
3053371392 bytes (3.1 GB) copied, 746.211 s, 4.1 MB/s
```

That's it, really! You can now boot into a Kali Live / Installer environment using the USB device.

Creating a Bootable Kali USB Drive on OS X

OS X is based on UNIX, so creating a bootable Kali Linux USB drive in an OS X environment is similar to doing it on Linux. Once you've downloaded and verified your chosen Kali ISO file, you use **dd** to copy it over to your USB stick.

WARNING: Although the process of imaging Kali on a USB drive is very easy, you can just as easily overwrite a disk drive you didn't intend to with **dd** if you do not understand what you are doing, or if you specify an incorrect output path. Double-check what you're doing ***before*** you do it, it'll be too late afterwards.

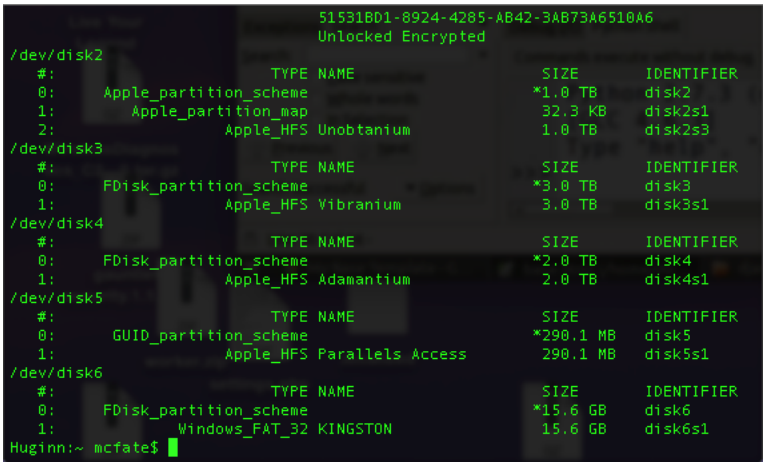
Consider yourself warned.

1. ***Without*** the USB drive plugged into the system, open a Terminal window, and type the command **diskutil list** at the command prompt.
2. You will get a list of the device paths (looking like **/dev/disk0**, **/dev/disk1**, etc.) of the disks mounted on your system, along with information on the partitions on each of the disks.

```
/dev/disk1
   #:                       TYPE NAME                    SIZE       IDENTIFIER
   0:                  Apple_HFS Macintosh HD           *499.0 GB   disk1
                                 Logical Volume on disk0s2
                                 51531BD1-8924-4285-AB42-3AB73A6510A6
                                 Unlocked Encrypted
/dev/disk2
   #:                       TYPE NAME                    SIZE       IDENTIFIER
   0:     Apple_partition_scheme                        *1.0 TB     disk2
   1:        Apple_partition_map                         32.3 KB    disk2s1
   2:                  Apple_HFS Unobtanium              1.0 TB     disk2s3
/dev/disk3
   #:                       TYPE NAME                    SIZE       IDENTIFIER
   0:     FDisk_partition_scheme                        *3.0 TB     disk3
   1:                  Apple_HFS Vibranium               3.0 TB     disk3s1
/dev/disk4
   #:                       TYPE NAME                    SIZE       IDENTIFIER
   0:     FDisk_partition_scheme                        *2.0 TB     disk4
   1:                  Apple_HFS Adamantium              2.0 TB     disk4s1
/dev/disk5
   #:                       TYPE NAME                    SIZE       IDENTIFIER
   0:      GUID_partition_scheme                        *290.1 MB   disk5
   1:                  Apple_HFS Parallels Access        290.1 MB   disk5s1
Huginn:~ mcfate$
```

3. Plug in your USB device to your Apple computer's USB port and run the command **diskutil list** a second time. Your USB drive's path will most likely be the last one. In any case, it will be one which wasn't present before. In this example, you can see

that there is now a /dev/disk6 which wasn't previously present.


51531BD1-8924-4285-AB42-3AB73A6510A6
Unlocked Encrypted
/dev/disk2
#: TYPE NAME SIZE IDENTIFIER
0: Apple_partition_scheme *1.0 TB disk2
1: Apple_partition_map 32.3 KB disk2s1
2: Apple_HFS Unobtanium 1.0 TB disk2s3
/dev/disk3
#: TYPE NAME SIZE IDENTIFIER
0: FDisk_partition_scheme *3.0 TB disk3
1: Apple_HFS Vibranium 3.0 TB disk3s1
/dev/disk4
#: TYPE NAME SIZE IDENTIFIER
0: FDisk_partition_scheme *2.0 TB disk4
1: Apple_HFS Adamantium 2.0 TB disk4s1
/dev/disk5
#: TYPE NAME SIZE IDENTIFIER
0: GUID_partition_scheme *290.1 MB disk5
1: Apple_HFS Parallels Access 290.1 MB disk5s1
/dev/disk6
#: TYPE NAME SIZE IDENTIFIER
0: FDisk_partition_scheme *15.6 GB disk6
1: Windows_FAT_32 KINGSTON 15.6 GB disk6s1
Huginn:~ mcfate$

4. Unmount the drive (assuming, for this example, the USB stick is **/dev/disk6** — *do* ***not*** *simply copy this, verify the correct path on your own system!*):

```
diskutil unmount /dev/disk6
```

1. Proceed to (carefully!) image the Kali ISO file on the USB device. The following command assumes that your USB drive is on the path /dev/disk6, and you're in the same directory with your Kali Linux ISO, which is named "kali-linux-2017.1-amd64.iso":

```
sudo dd if=kali-linux-2017.1-amd64.iso of=/dev/disk6 bs=1m
```

Note: Increasing the blocksize (bs) will speed up the write progress, but will also increase the chances of creating a bad USB stick. Using the given value on OS X has produced reliable images consistently.

Imaging the USB drive can take a good amount of time, over half an hour is not unusual, as the sample output below shows. Be patient!

The dd command provides no feedback until it's completed, but if your drive has an access indicator, you'll probably see it flickering from time to time. The time to **dd** the image across will depend on the speed of the system used, USB drive itself, and USB port it's inserted into. Once dd has finished imaging the drive, it will output something that looks like this:

```
2911+1 records in
2911+1 records out
3053371392 bytes transferred in 2151.132182 secs (1419425 bytes/sec)
```

And that's it! You can now boot into a Kali Live / Installer environment using the USB device.

To boot from an alternate drive on an OS X system, bring up the boot menu by pressing the **Option** key immediately after powering on the device and select the drive you want to use.

For more information, see Apple's knowledge base.

Kali Linux Live USB Persistence

/02. Kali Linux Live /Kali Linux Live USB Persistence

• 02. Kali Linux Live

Adding Persistence to a Kali Linux "Live" USB Drive

Kali Linux "Live" has two options in the default boot menu which enable persistence — the preservation of data on the "Kali Live" USB drive — across reboots of "Kali Live". This can be an extremely useful enhancement, and enables you to retain documents, collected testing results, configurations, etc., when running Kali Linux "Live" from the USB drive, even across different systems. The persistent data is stored in its own partition on the USB drive, which can also be optionally LUKS-encrypted.

To make use of the USB persistence options at boot time, you'll need to do some additional setup on your "Kali Linux Live" USB drive; this article will show you how.

This guide assumes that you have already created a Kali Linux "Live" USB drive as described in the section on that subject. For the purposes of this article, we'll assume you're working on a Linux-based system.

You'll need to have root privileges to do this procedure, or the ability to escalate your privileges with the command "sudo su". In this example, we assume

- you are running as the **root user**
- your USB drive is **/dev/sdb**

- your USB drive has a capacity of **at least 8GB** — the Kali Linux image takes over 3GB, and for this guide, we'll be creating a new partition of about 4GB to store our persistent data in.

In this example, we'll create a new partition to store our persistent data into, starting right above the second Kali Live partition and ending at 7GB, put an ext3 file system onto it, and create a **persistence.conf** file on the new partition.

1. First, begin by imaging the latest Kali Linux ISO (currently 2016.2) to your USB drive as described in this article. We're going to assume that the two partitions created by the imaging are **/dev/sdb1** and **/dev/sdb2**. This can be verified with the command "**fdisk -l**".

2. Create and format an additional partition on the USB drive.
First, let's create the new partition in the empty space above our Kali Live partitions.

```
end=7gb
read start _ < <(du -bcm kali-linux-2016.2-amd64.iso | tail -1); echo $start
parted /dev/sdb mkpart primary $start $end
```

The **parted** command may advise you that it can't use the exact start values you specified; if so, accept the suggested value instead. If advised that the partition isn't placed at an optimal location, "ignore" it. When parted completes, the new partition should have been created at **/dev/sdb3**; again, this can be verified with the command "**fdisk -l**".

3. Next, create an **ext3** file system in the partition and label it "persistence".

```
mkfs.ext3 -L persistence /dev/sdb3
e2label /dev/sdb3 persistence
```

4. Create a mount point, mount the new partition there, and then create the configuration file to enable persistence. Finally, unmount the partition.

```
mkdir -p /mnt/my_usb
mount /dev/sdb3 /mnt/my_usb
echo "/ union" > /mnt/my_usb/persistence.conf
umount /dev/sdb3
```

Adding USB Persistence with LUKS Encryption

Alternatively, you can create a LUKS-encrypted persistent storage area. This adds an extra layer of security to your sensitive files when traveling with Kali Live on USB devices. In the following example, we'll create a new partition to store our persistent data into, starting right above the second Kali Live partition and ending at 7GB, set up LUKS encryption on the new partition, put an ext3 file system onto it, and create a **persistence.conf** file on it.

1. Image the latest Kali Linux ISO (currently 2016.2) to your USB drive as described in this article.

2. Create the new partition in the empty space above our Kali Live partitions.

```
end=7gb
read start _ < <(du -bcm kali-linux-2016.2-amd64.iso | tail -1); echo $start
parted /dev/sdb mkpart primary $start $end
```

The parted command may advise you that it can't use the exact start value you specified; if so, accept the suggested value instead. If advised that the partition isn't placed at an optimal location, "ignore" it. When parted completes, the new partition should have been created at /dev/sdb3; again, this can be verified with the command "**fdisk -l**".

3. Initialize the LUKS encryption on the newly-created partition. You'll be warned that this will overwrite any data on the partion. When prompted whether you want to proceed, type "YES" (all upper case). Enter your selected passphrase twice when asked to do so, and be sure to pick a passphrase you're going to remember: if you forget it, your data will still be persistent, just irretrievable (and unusable).

```
cryptsetup --verbose --verify-passphrase luksFormat /dev/sdb3
cryptsetup luksOpen /dev/sdb3 my_usb
```

4. Create the ext3 filesystem, and label it "persistence".

```
mkfs.ext3 -L persistence /dev/mapper/my_usb
e2label /dev/mapper/my_usb persistence
```

5. Create a mount point, mount our new encrypted partition there, set up the **persistence.conf** file, and unmount the partition.

```
mkdir -p /mnt/my_usb
mount /dev/mapper/my_usb /mnt/my_usb
echo "/ union" > /mnt/my_usb/persistence.conf
umount /dev/mapper/my_usb
```

6. Close the encrypted channel to our persistence partition.

```
cryptsetup luksClose /dev/mapper/my_usb
```

That's really all there is to it! To use the persistent data features, simply plug your USB drive into the computer you want to boot up Kali Live on — make sure your BIOS is set to boot from your USB device — and fire it up. When the Kali Linux boot screen is displayed, choose the persistent option you set up on your USB drive, either normal or encrypted.

Live Build a Custom Kali ISO

An Introduction to Building Your Own Kali ISO

Building a customized Kali ISO is easy, fun, and rewarding. You can configure virtually any aspect of your Kali ISO build using the Debian live-build scripts. These scripts allow developers to easily build live system images by providing a framework that uses a configuration set to automate and customize all aspects of building the image. The Kali Linux development team has adopted these scripts and they're used to produce the official Kali ISO releases.

Where Should You Build Your ISO?

Ideally, you should build your custom Kali ISO from **within a pre-existing Kali environment**.

Getting Ready — Setting up the live-build system

We first need to prepare the Kali ISO build environment by installing and setting up live-build and its requirements with the following commands:

```
apt install -y curl git live-build cdebootstrap
git clone git://git.kali.org/live-build-config.git
```

Now you can simply build an updated Kali ISO by entering the "live-build-config" directory and running our **build.sh** wrapper script, as follows:

```
cd live-build-config/
./build.sh --verbose
```

The "build.sh" script will take a while to complete, as it downloads all of the required packages needed to create your ISO. Good time for a coffee.

Configuring the Kali ISO Build (Optional)

If you want to customize your Kali Linux ISO, this section will explain some of the details. Through the **kali-config** directory, the Kali Linux live build supports a wide range of customization options, which are well-documented on the Debian live build 4.x page. However, for the impatient, here are some of the highlights.

Building Kali with Different Desktop Environments

Since Kali 2.0, we now support built in configurations for various desktop environments, including KDE, Gnome, E17, I3WM, LXDE, MATE and XFCE. To build any of these, you would use syntax similar to the following:

```
# These are the different Desktop Environment build options:
#./build.sh --variant {gnome,kde,xfce,mate,e17,lxde,i3wm} --verbose

# To build a KDE ISO:
./build.sh --variant kde --verbose
# To build a MATE ISO:
./build.sh --variant mate --verbose

#...and so on.
```

Controlling the packages included in your build

The list of packages included in your build will be present in the the respective kali-$variant directory. For example, if you're building a default Gnome ISO, you would use the following package lists file – **kali-config/variant-gnome/package-lists/kali.list.chroot**. By default, this list includes the "kali-linux-full" metapackage, as well as some others. These can be commented out and replaced with a manual list of packages to include in the ISO for greater granularity.

Build hooks, binary and chroot

Live-build hooks allows us to hook scripts in various stages of the Kali ISO live build. For more detailed information about hooks and how to use them, refer to the live build manual. As an example, we recommend you check out the existing hooks in **kali-config/common/hooks/**.

Overlaying files in your build

You have the option to include additional files or scripts in your build by overlaying them on the existing filesystem, inside the **includes.{chroot,binary,installer}** directories, respectively. For example, if we wanted to include our own custom script into the **/root/**directory of the ISO (this would correspond to the "chroot" stage), then we would drop this script file in the **kali-config/common/includes.chroot/** directory before building the ISO.

Building a Kali Linux ISO for older i386 architectures

The Kali Linux i386 ISO has PAE enabled. If you require a default kernel for older hardware with PAE disabled, you will need to rebuild a Kali Linux ISO. The rebuilding process is much the same as described above, except that the **686-pae** parameter that needs to be changed to **586** in **auto/config** as follows. First, install the prerequisites.

```
apt install -y git live-build cdebootstrap debootstrap
git clone git://git.kali.org/live-build-config.git
```

Next, make the change in auto/config for the appropriate architecture:

```
cd live-build-config/
sed -i 's/686-pae/686/g' auto/config
```

Finally, run your build.

```
./build.sh --arch i386 --verbose
```

Building Kali on Non-Kali Debian Based Systems

You can easily run live-build on Debian based systems other than Kali. The instructions below have been tested to work with both Debian and Ubuntu.

First, we prep the system by ensuring it is fully updated, then proceed to download the Kali archive keyring and live-build packages.

```
sudo apt update
sudo apt upgrade
cd /root/
```

```
wget http://http.kali.org/pool/main/k/kali-archive-keyring/kali-archive-keyring_2018.1_all.deb
wget https://archive.kali.org/kali/pool/main/l/live-build/live-build_20180618kali1_all.deb
```

With that completed, we install some additional dependencies and the previously downloaded files.

```
sudo apt install -y git live-build cdebootstrap debootstrap curl
sudo dpkg -i kali-archive-keyring_2018.1_all.deb
sudo dpkg -i live-build_20180618kali1_all.deb
```

With the environment all prepared, we start the live-build process by setting up the build script and checking out the build config.

```
cd /usr/share/debootstrap/scripts/
echo "default_mirror http://http.kali.org/kali"; sed -e "s/debian-archive-keyring.gpg/kali-archive-keyring.gpg/g" sid > /tmp/kali
sudo mv /tmp/kali .
sudo ln -s kali kali-rolling

cd ~
git clone git://git.kali.org/live-build-config.git

cd live-build-config/
```

At this point, we have to edit the `build.sh` script to bypass a version check. We do this by commenting out the “exit 1” below.

```
# Check we have a good debootstrap
ver_debootstrap=$(dpkg-query -f '${Version}' -W debootstrap)
if dpkg --compare-versions "$ver_debootstrap" lt "1.0.97"; then
if ! echo "$ver_debootstrap" | grep -q kali; then
echo "ERROR: You need debootstrap >= 1.0.97 (or a Kali patched debootstrap). Your current version: $ver_debootstrap" >&2
exit 1
fi
fi
```

With that change made, the script should like as follows:

```
# Check we have a good debootstrap
ver_debootstrap=$(dpkg-query -f '${Version}' -W debootstrap)
if dpkg --compare-versions "$ver_debootstrap" lt "1.0.97"; then
if ! echo "$ver_debootstrap" | grep -q kali; then
echo "ERROR: You need debootstrap >= 1.0.97 (or a Kali patched debootstrap). Your current version: $ver_debootstrap" >&2
# exit 1
fi
fi
```

At this point, we can build our ISO as normal

```
sudo ./build.sh --variant light --verbose
```

Kali Linux Hard Disk Install

Kali Linux Installation Requirements

Installing Kali Linux on your computer is an easy process. First, you'll need compatible computer hardware. Kali is supported on i386, amd64, and ARM (both armel and armhf) platforms. The hardware requirements are minimal as listed below, although better hardware will naturally provide better performance. The i386 images have a default PAEkernel, so you can run them on systems with over 4GB of RAM. Download Kali Linux and either burn the ISO to DVD, or prepare a USB stick with Kali Linux Live as the installation medium. If you do not have a DVD drive or USB port on your computer, check out the Kali Linux Network Install.

Installation Prerequisites

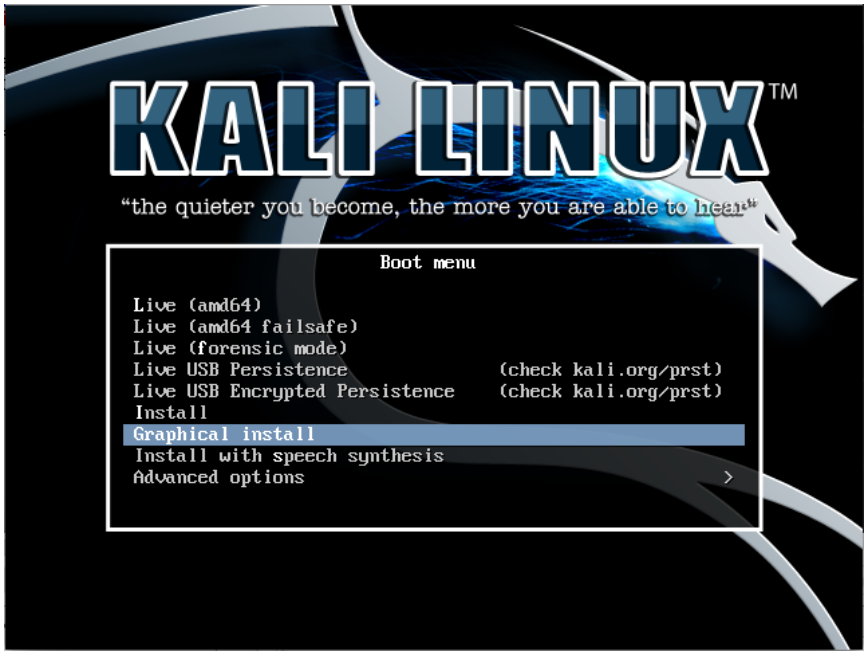
- A minimum of 20 GB disk space for the Kali Linux install.
- RAM for i386 and amd64 architectures, minimum: 1GB, recommended: 2GB or more.
- CD-DVD Drive / USB boot support

Preparing for the Installation

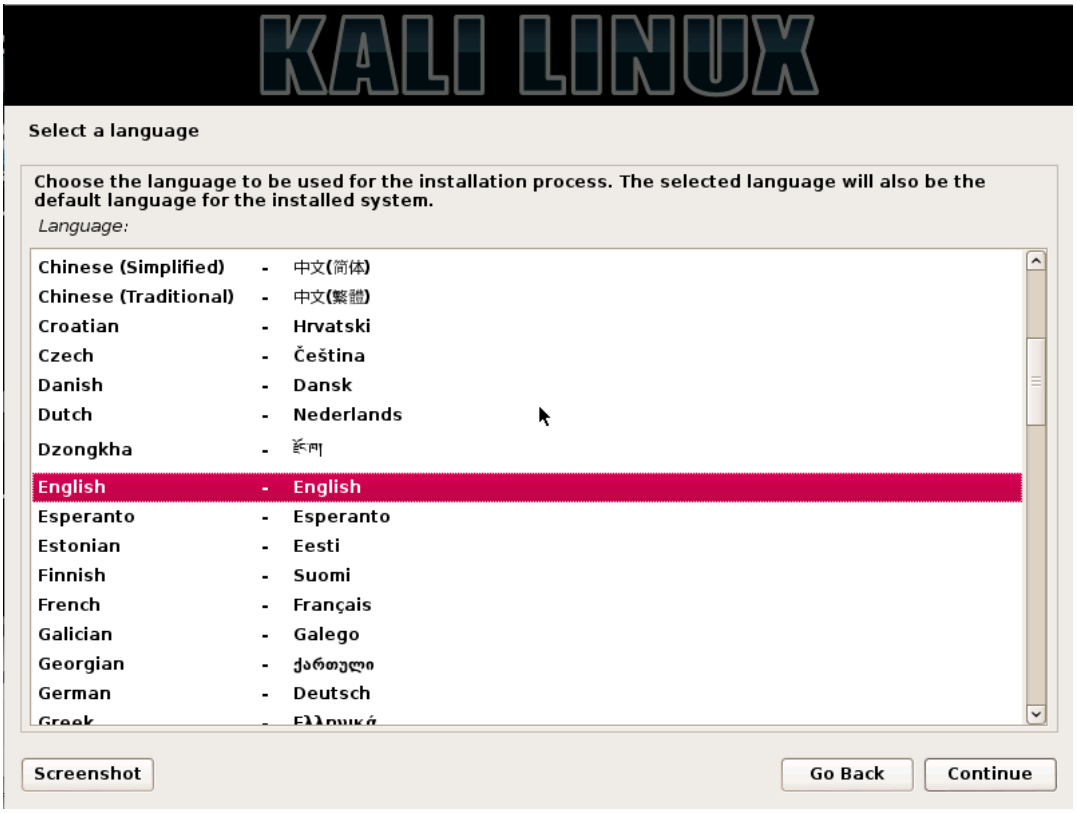
1. Download Kali linux.
2. Burn The Kali Linux ISO to DVD or Image Kali Linux Live to USB.
3. Ensure that your computer is set to boot from CD / USB in your BIOS.

Kali Linux Installation Procedure

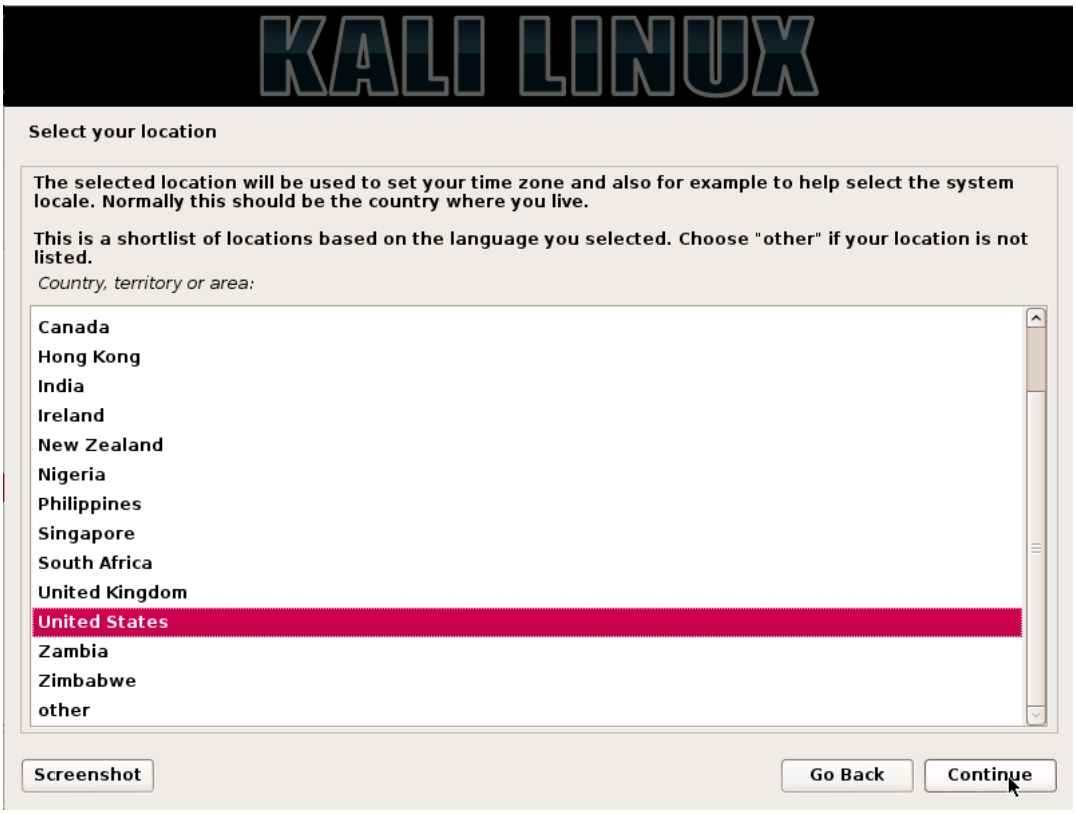
1. To start your installation, boot with your chosen installation medium. You should be greeted with the Kali Boot screen. Choose either *Graphical* or *Text-Mode* install. In this example, we chose a GUI install.



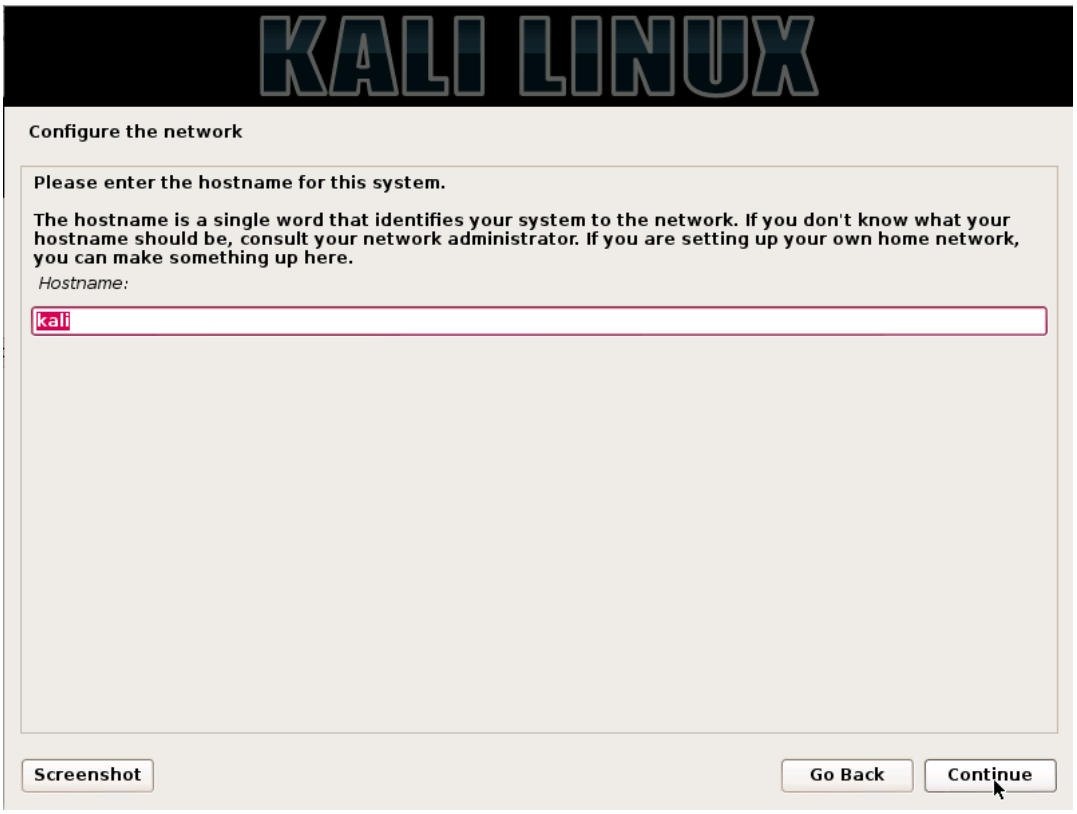
2. Select your preferred language and then your country location. You'll also be prompted to configure your keyboard with the appropriate keymap.


KALI LINUX
Select a language
Choose the language to be used for the installation process. The selected language will also be the default language for the installed system.
Language:
Chinese (Simplified) - 中文(简体)
Chinese (Traditional) - 中文(繁體)
Croatian - Hrvatski
Czech - Čeština
Danish - Dansk
Dutch - Nederlands
Dzongkha - རྫོང་ཁ
English - English
Esperanto - Esperanto
Estonian - Eesti
Finnish - Suomi
French - Français
Galician - Galego
Georgian - ქართული
German - Deutsch
Greek - Ελληνικά
Screenshot
Go Back
Continue

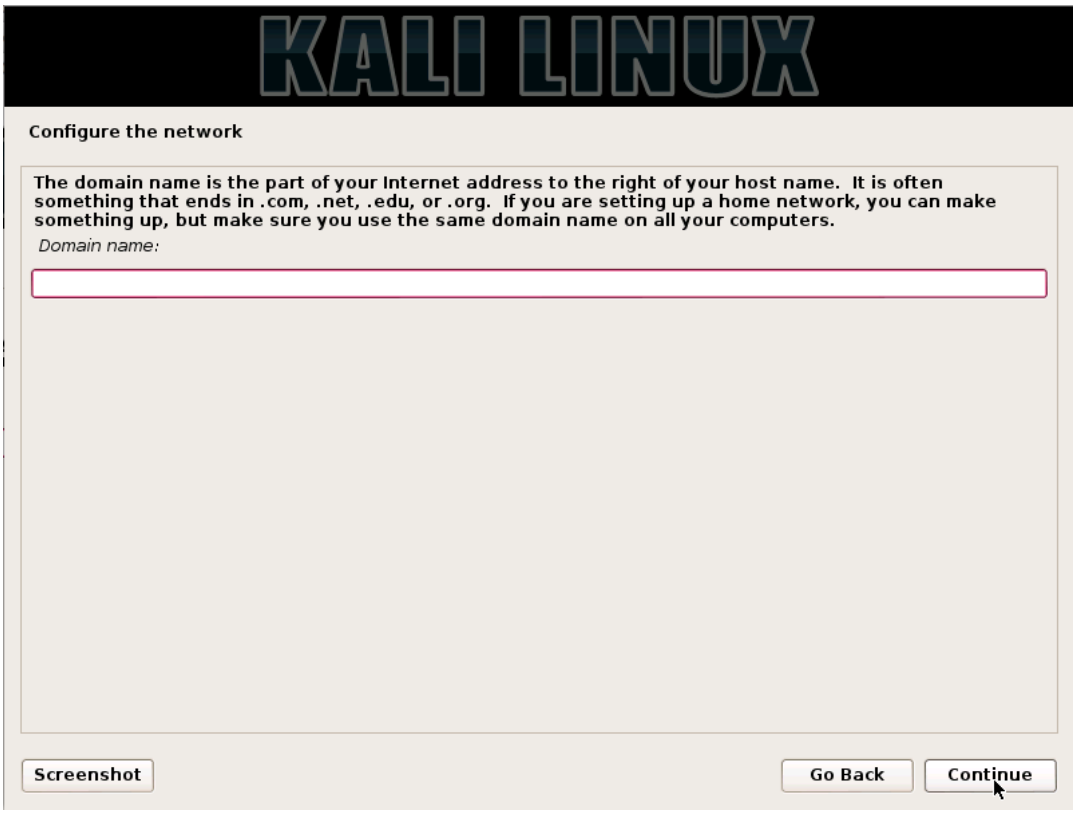
3. Specify your geographic location.



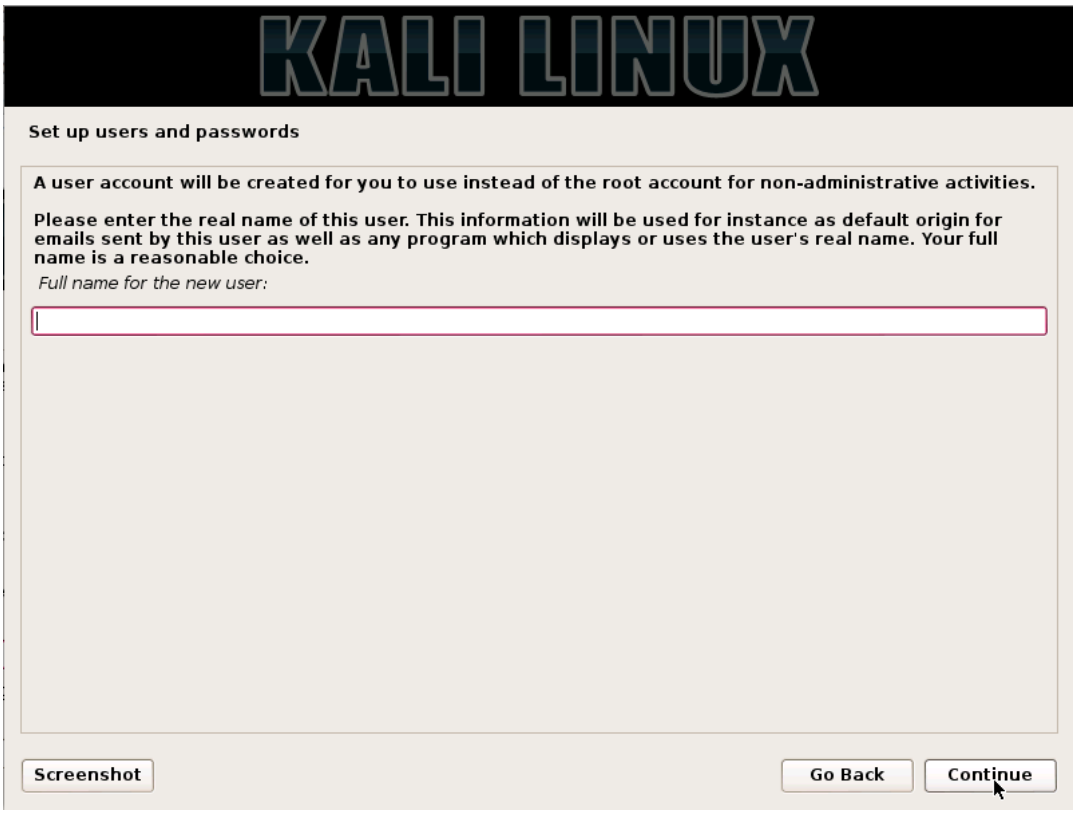
4. The installer will copy the image to your hard disk, probe your network interfaces, and then prompt you to enter a hostname for your system. In the example below, we've entered "kali" as our hostname.


KALI LINUX
Configure the network
Please enter the hostname for this system.
The hostname is a single word that identifies your system to the network. If you don't know what your hostname should be, consult your network administrator. If you are setting up your own home network, you can make something up here.
Hostname:
kali
Screenshot
Go Back
Continue

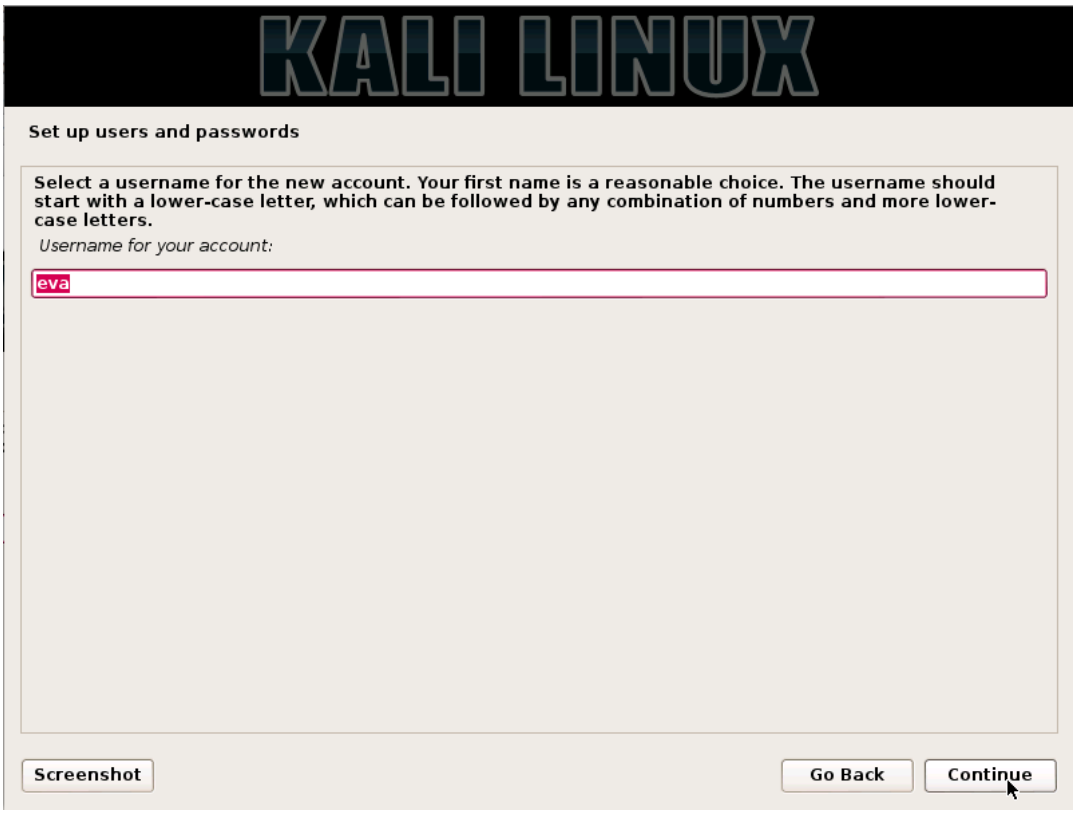
5. You may optionally provide a default domain name for this system to use.


KALI LINUX
Configure the network
The domain name is the part of your Internet address to the right of your host name. It is often something that ends in .com, .net, .edu, or .org. If you are setting up a home network, you can make something up, but make sure you use the same domain name on all your computers.
Domain name:
Screenshot
Go Back
Continue

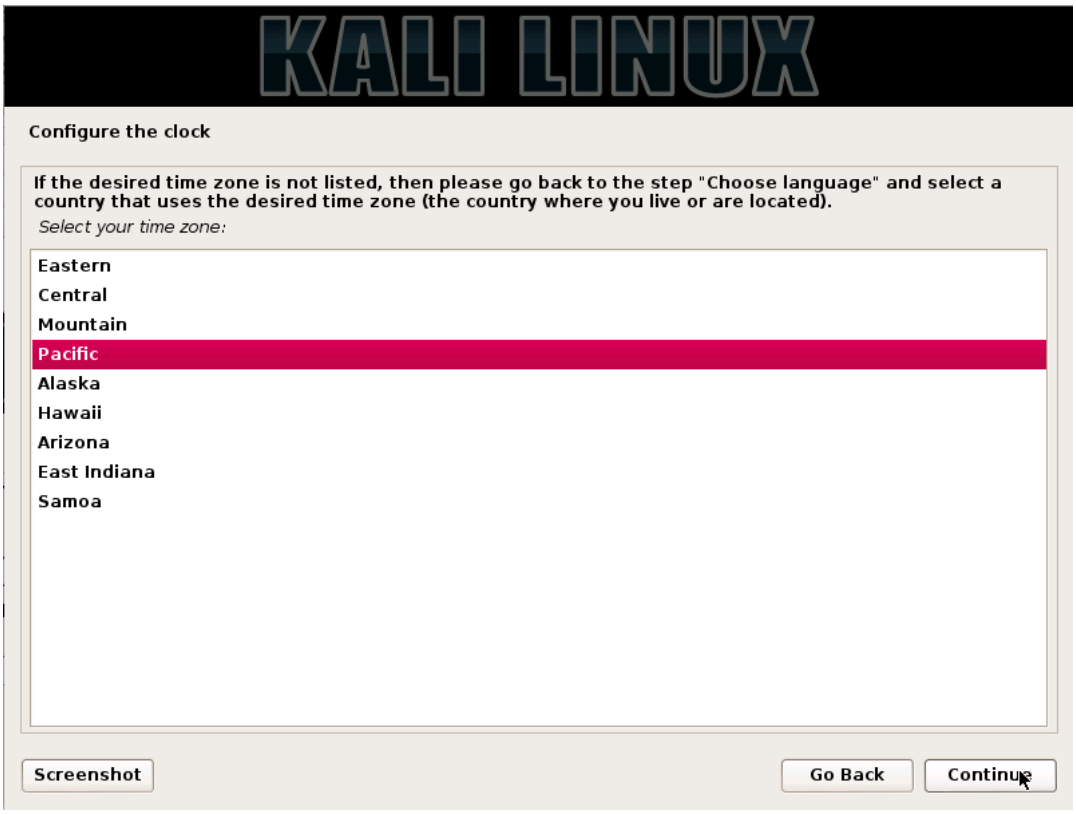
6. Next, provide a full name for a non-root user for the system.


KALI LINUX
Set up users and passwords
A user account will be created for you to use instead of the root account for non-administrative activities.
Please enter the real name of this user. This information will be used for instance as default origin for emails sent by this user as well as any program which displays or uses the user's real name. Your full name is a reasonable choice.
Full name for the new user:
Screenshot
Go Back
Continue

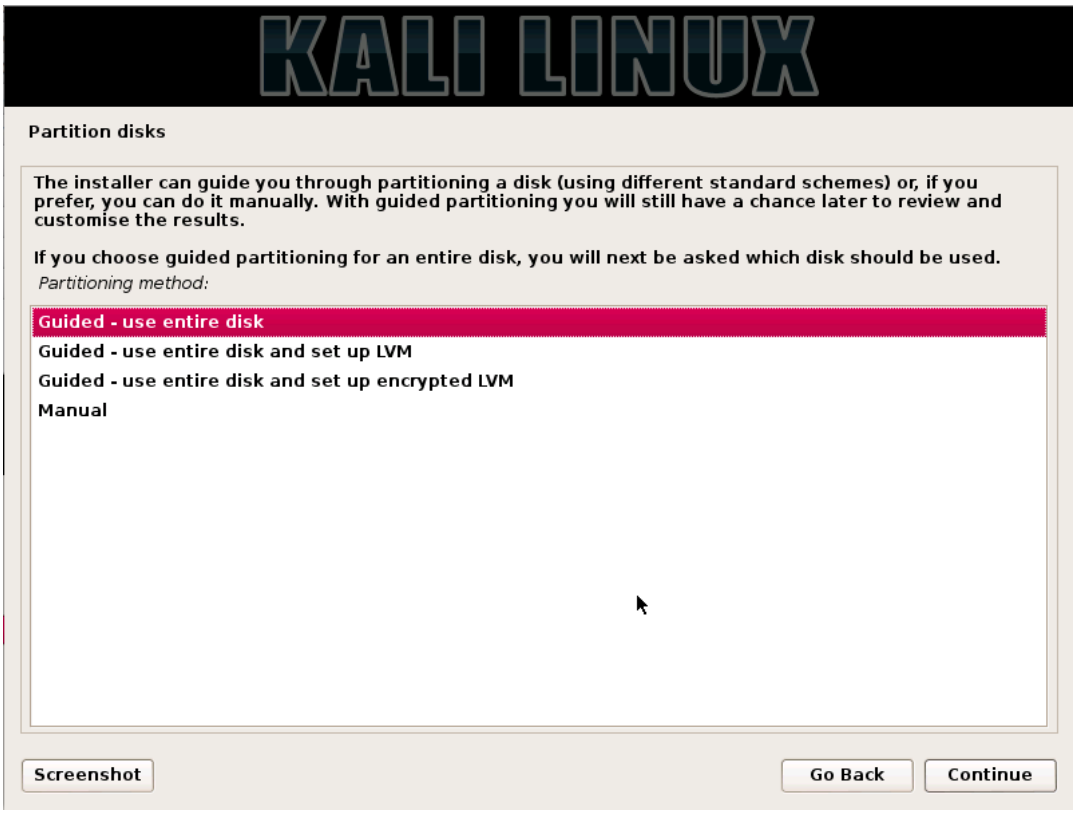
7. A default user ID will be created, based on the full name you provided. You can change this if you like.


KALI LINUX
Set up users and passwords
Select a username for the new account. Your first name is a reasonable choice. The username should start with a lower-case letter, which can be followed by any combination of numbers and more lower-case letters.
Username for your account:
eva
Screenshot
Go Back
Continue

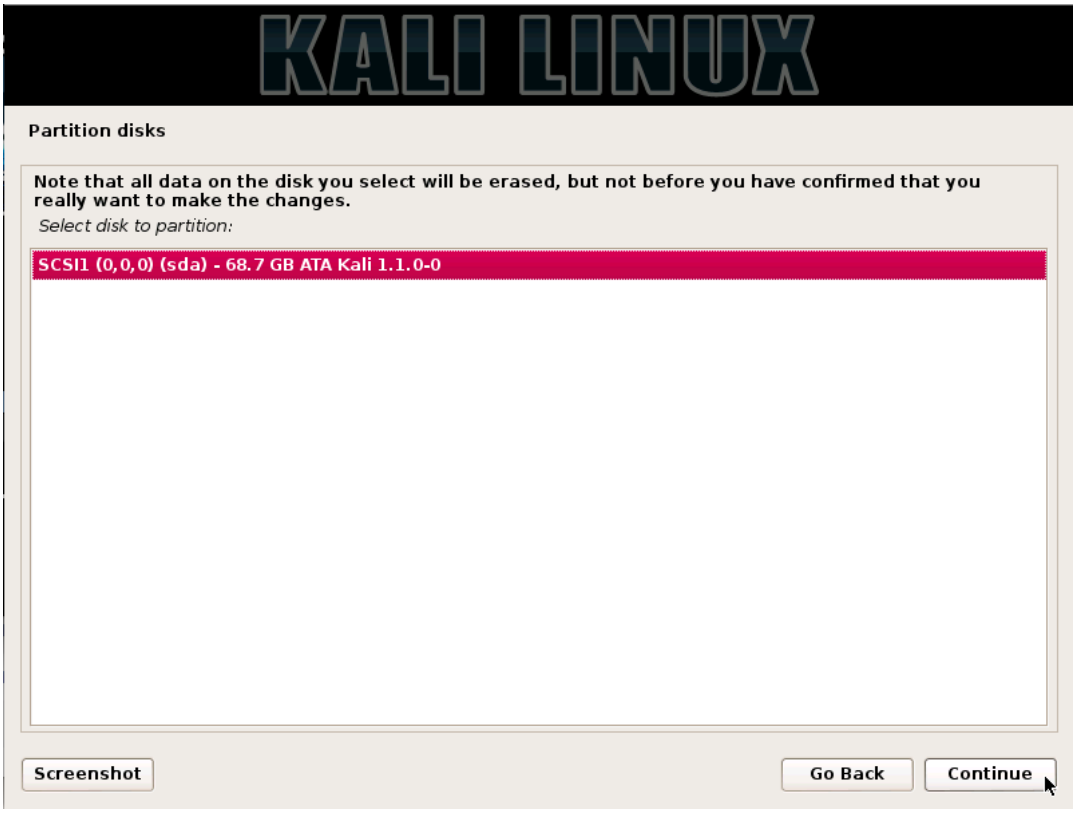
8. Next, set your time zone.



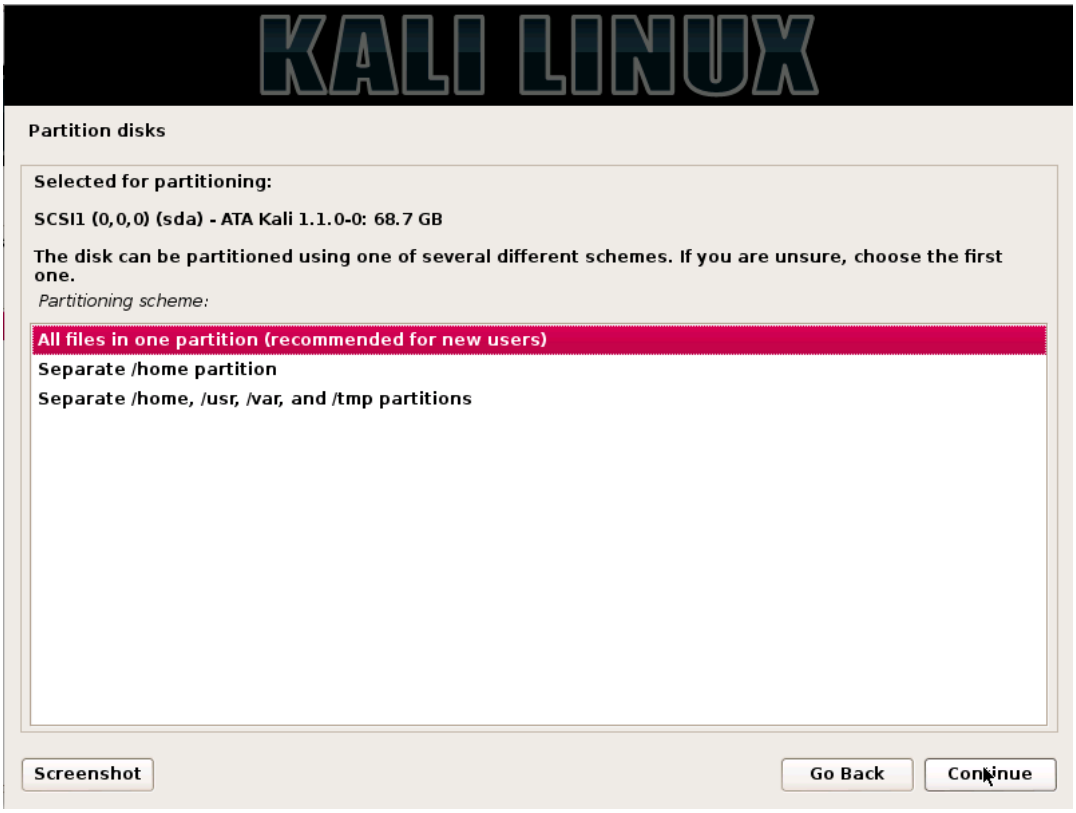
9. The installer will now probe your disks and offer you four choices. In our example, we're using the entire disk on our computer and not configuring LVM (logical volume manager). Experienced users can use the "Manual" partitioning method for more granular configuration options.


KALI LINUX
Partition disks
The installer can guide you through partitioning a disk (using different standard schemes) or, if you prefer, you can do it manually. With guided partitioning you will still have a chance later to review and customise the results.
If you choose guided partitioning for an entire disk, you will next be asked which disk should be used.
Partitioning method:
Guided - use entire disk
Guided - use entire disk and set up LVM
Guided - use entire disk and set up encrypted LVM
Manual
Screenshot
Go Back
Continue

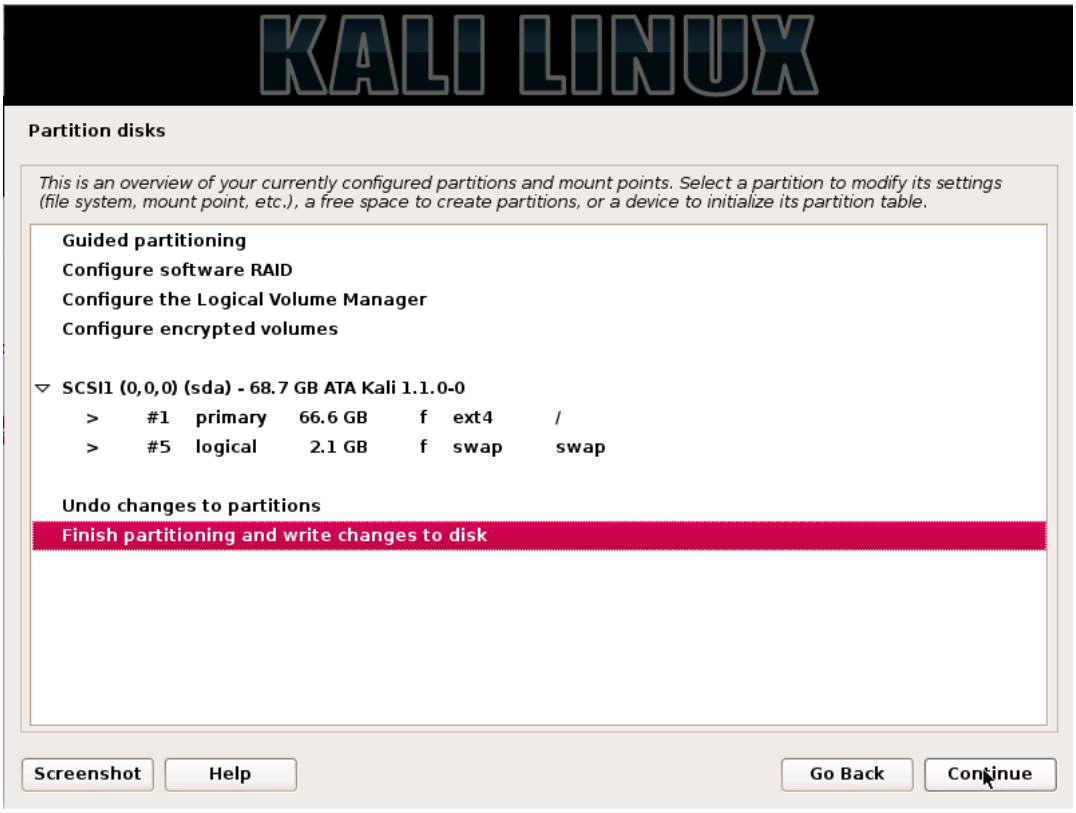
10.Select the disk to be partitioned.


KALI LINUX
Partition disks
Note that all data on the disk you select will be erased, but not before you have confirmed that you really want to make the changes.
Select disk to partition:
SCSI1 (0,0,0) (sda) - 68.7 GB ATA Kali 1.1.0-0
Screenshot
Go Back
Continue

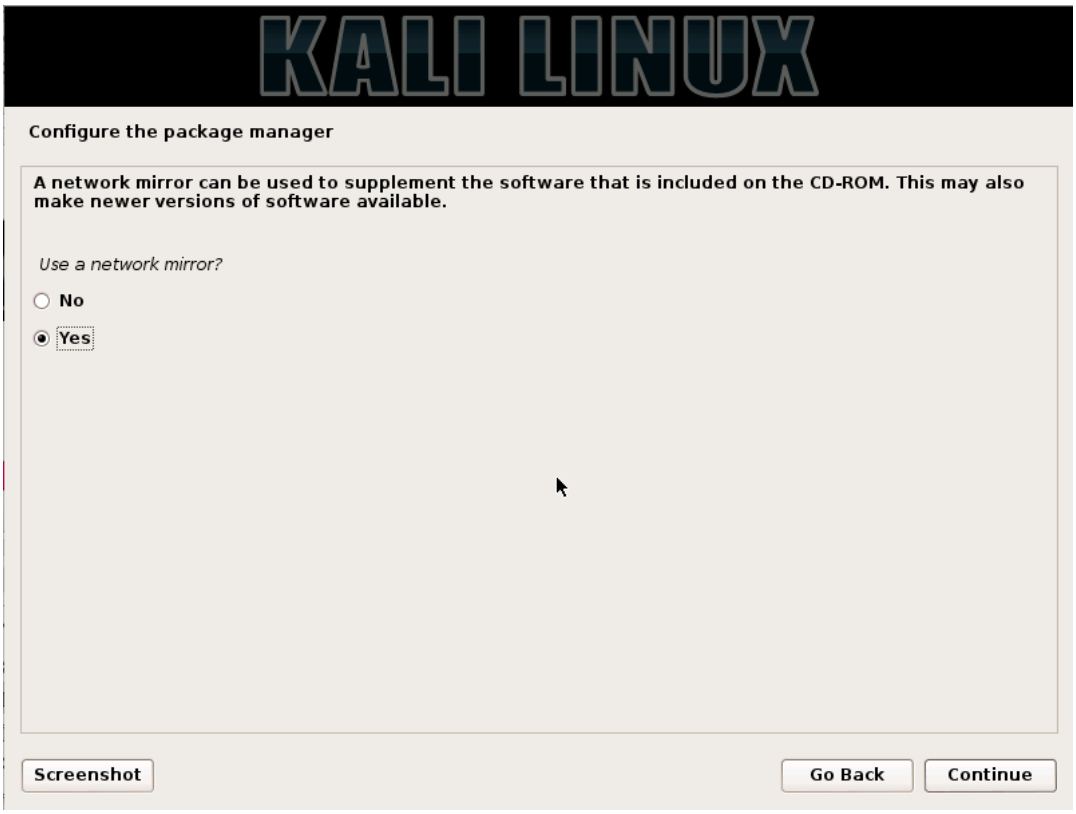
11. Depending on your needs, you can choose to keep all your files in a single partition — the default — or to have separate partitions for one or more of the top-level directories. If you're not sure which you want, you want "All files in one partition".


KALI LINUX
Partition disks
Selected for partitioning:
SCSI1 (0,0,0) (sda) - ATA Kali 1.1.0-0: 68.7 GB
The disk can be partitioned using one of several different schemes. If you are unsure, choose the first one.
Partitioning scheme:
All files in one partition (recommended for new users)
Separate /home partition
Separate /home, /usr, /var, and /tmp partitions
Screenshot
Go Back
Continue

12. Next, you'll have one last chance to review your disk configuration before the installer makes irreversible changes. After you click *Continue*, the installer will go to work and you'll have an almost finished installation.

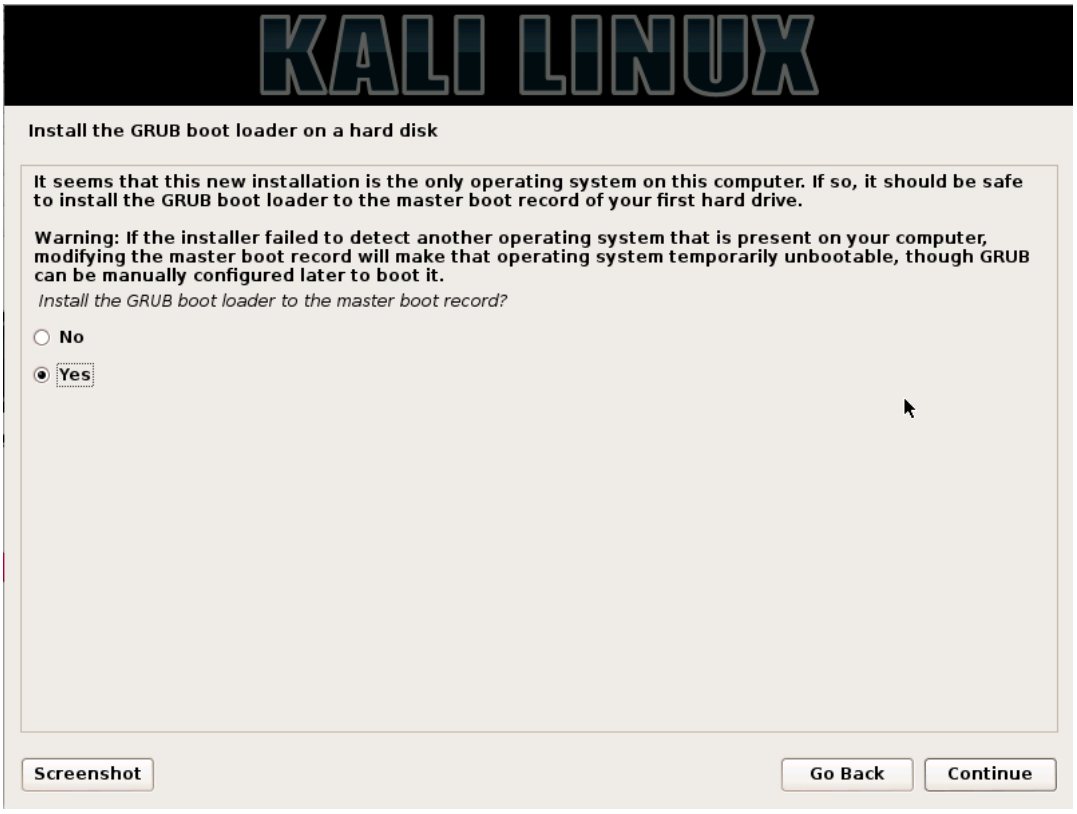

KALI LINUX
Partition disks
This is an overview of your currently configured partitions and mount points. Select a partition to modify its settings (file system, mount point, etc.), a free space to create partitions, or a device to initialize its partition table.
Guided partitioning
Configure software RAID
Configure the Logical Volume Manager
Configure encrypted volumes
SCSI1 (0,0,0) (sda) - 68.7 GB ATA Kali 1.1.0-0
> #1 primary 66.6 GB f ext4 /
> #5 logical 2.1 GB f swap swap
Undo changes to partitions
Finish partitioning and write changes to disk
Screenshot
Help
Go Back
Continue

13. Configure network mirrors. Kali uses a central repository to distribute applications. You'll need to enter any appropriate proxy information as needed.

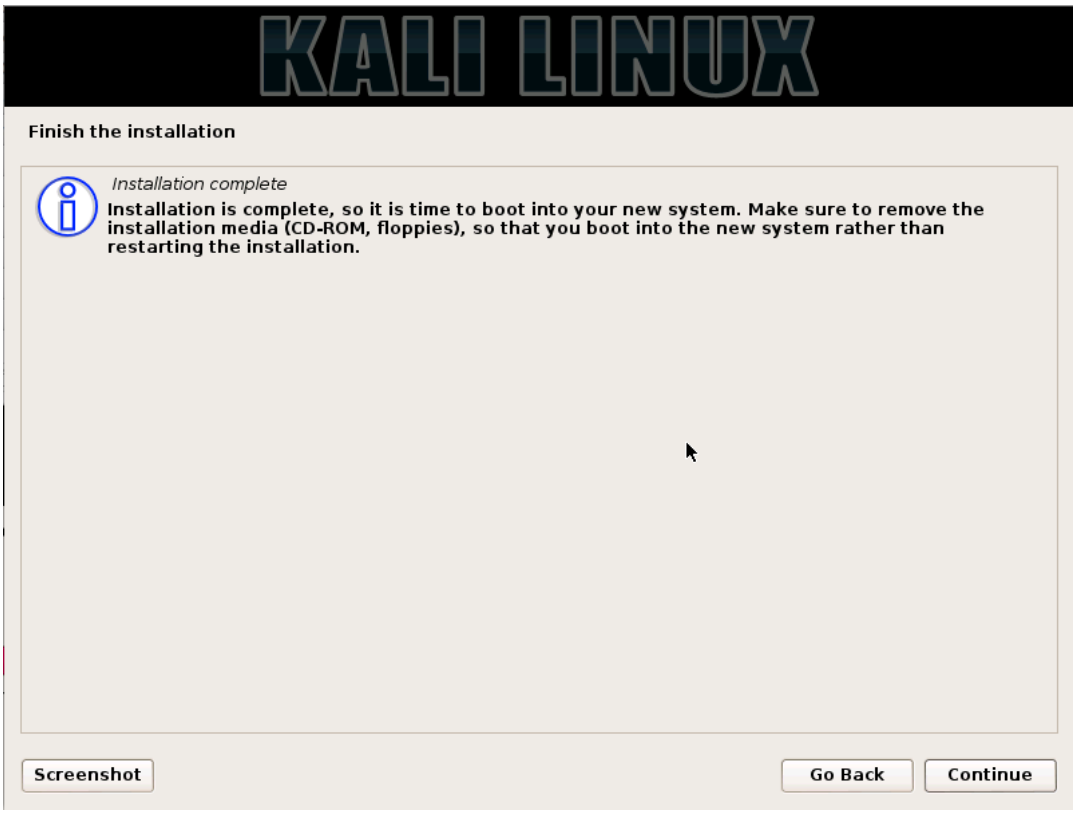

KALI LINUX
Configure the package manager
A network mirror can be used to supplement the software that is included on the CD-ROM. This may also make newer versions of software available.
Use a network mirror?
No
Yes
Screenshot
Go Back
Continue

NOTE! If you select “NO” in this screen, you will **NOT** be able to install packages from Kali repositories.

14.Next, install GRUB.


KALI LINUX
Install the GRUB boot loader on a hard disk
It seems that this new installation is the only operating system on this computer. If so, it should be safe to install the GRUB boot loader to the master boot record of your first hard drive.
Warning: If the installer failed to detect another operating system that is present on your computer, modifying the master boot record will make that operating system temporarily unbootable, though GRUB can be manually configured later to boot it.
Install the GRUB boot loader to the master boot record?
No
Yes
Screenshot
Go Back
Continue

15.Finally, click Continue to reboot into your new Kali installation.


KALI LINUX
Finish the installation
Installation complete
Installation is complete, so it is time to boot into your new system. Make sure to remove the installation media (CD-ROM, floppies), so that you boot into the new system rather than restarting the installation.
Screenshot
Go Back
Continue

Post Installation

Now that you've completed installing Kali Linux, it's time to customize your system. The Kali General Use section of our site has more information and you can also find tips on how to get the most out of Kali in our User Forums.

Dual Boot Kali with Windows

/03. Installing Kali Linux /Dual Boot Kali with Windows

Kali Linux Dual Boot with Windows

Installing Kali alongside a Windows installation can be quite useful. However, you need to exercise caution during the setup process. First, make sure that you've backed up any important data on your Windows installation. Since you'll be modifying your hard drive, you'll want to store this backup on external media. Once you've completed the backup, we recommend you

peruse Kali Linux Hard Disk Install, which explains the normal procedure for a basic Kali install.

In our example, we will be installing Kali Linux alongside an installation of Windows 7, which is currently taking up 100% of the disk space in our computer. We will start by resizing our current Windows partition to occupy less space and then proceed to install Kali Linux in the newly-created empty partition.

Download Kali Linux and either burn the ISO to DVD, or prepare a USB stick with Kali linux Live as the installation medium. If you do not have a DVD or USB port on your computer, check out the Kali Linux Network Install. Ensure you have:

- Minimum of 20 GB free disk space on Windows
- CD-DVD / USB boot support

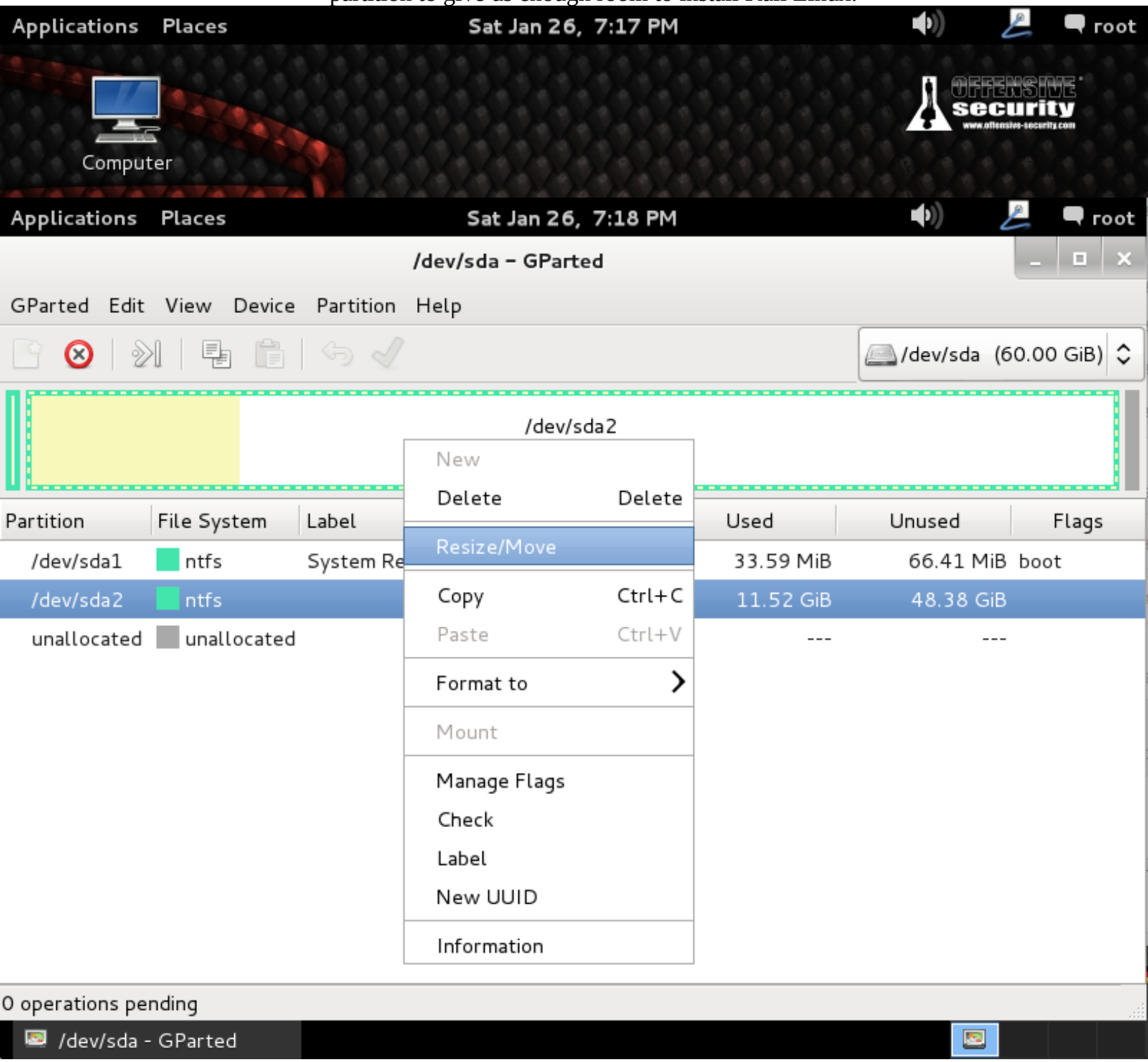
Preparing for the Installation

1. Download Kali Linux.
2. Burn The Kali Linux ISO to DVD or copy Kali Linux Live to USB.
3. Ensure that your computer is set to boot from CD / USB in your BIOS.

Dual Boot Installation Procedure

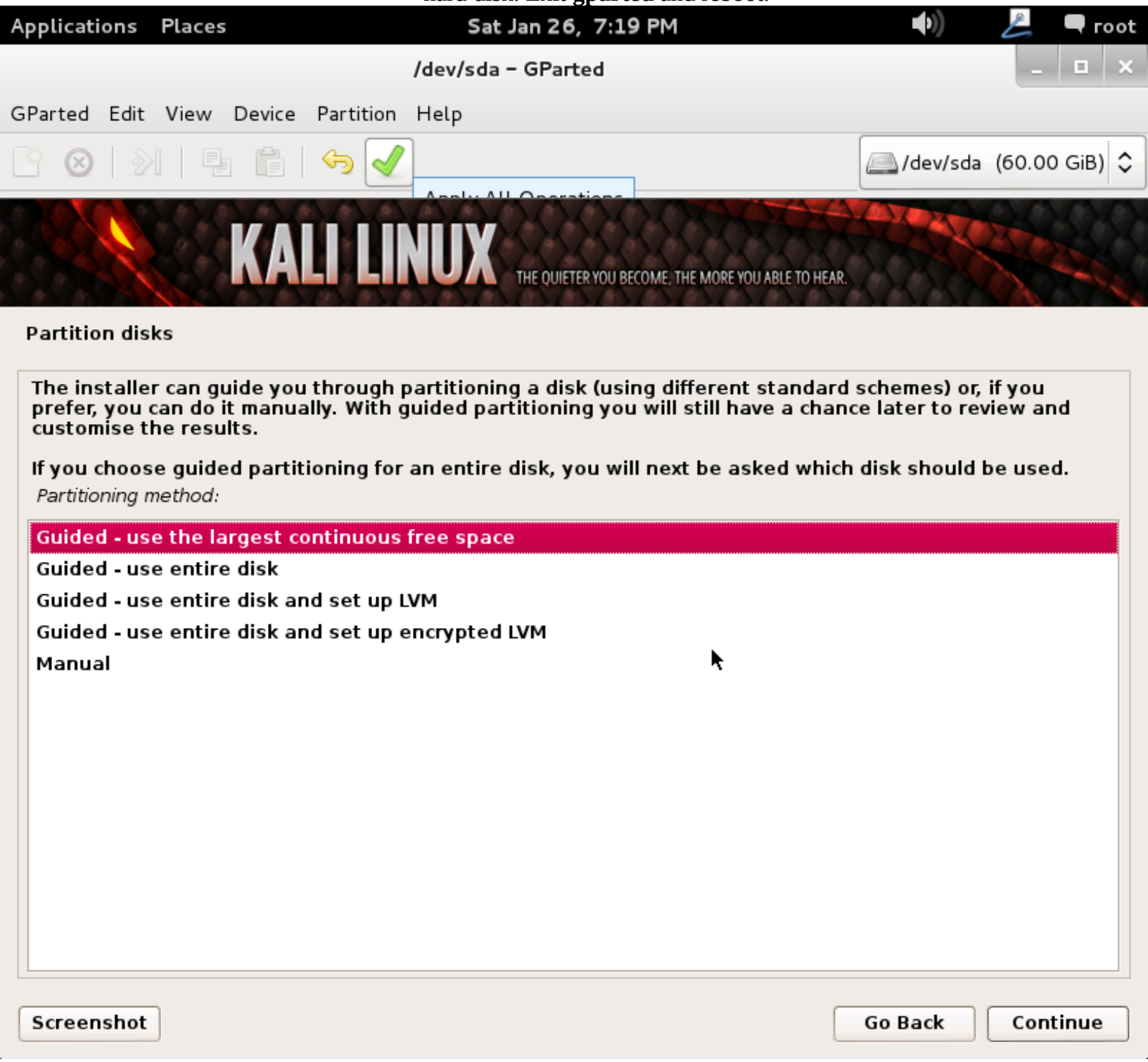
1. To start your installation, boot with your chosen installation medium. You should be greeted with the Kali Boot screen. Select *Live*, and you should be booted into the Kali Linux default desktop.

2. Now launch the **gparted** program. We'll use **gparted** to shrink the existing Windows partition to give us enough room to install Kali Linux.



3. Select your Windows partition. Depending on your system, it will usually be the second, larger partition. In our example, there are two partitions; the first is the System Recovery partition, and Windows is actually installed in /dev/sda2. Resize your Windows partition and leave enough space (20 GB minimum) for the Kali installation.

4. Once you have resized your Windows partition, ensure you “Apply All Operations” on the hard disk. Exit **gparted** and reboot.


Applications Places
Sat Jan 26, 7:19 PM
root
/dev/sda – GParted
GParted Edit View Device Partition Help
/dev/sda (60.00 GiB)
KALI LINUX
THE QUIETER YOU BECOME, THE MORE YOU ABLE TO HEAR.
Partition disks
The installer can guide you through partitioning a disk (using different standard schemes) or, if you prefer, you can do it manually. With guided partitioning you will still have a chance later to review and customise the results.
If you choose guided partitioning for an entire disk, you will next be asked which disk should be used.
Partitioning method:
Guided - use the largest continuous free space
Guided - use entire disk
Guided - use entire disk and set up LVM
Guided - use entire disk and set up encrypted LVM
Manual
Screenshot
Go Back
Continue

Kali Linux Installation Procedure

1. The installation procedure from this point onwards is similar to a Kali Linux Hard Disk install, until the point of the partitioning, where you need to select “Guided – use the largest continuous free space” that you created earlier with **gparted**.

2. Once the installation is done, reboot. You should be greeted with a GRUB boot menu, which will allow you to boot either into Kali or Windows.

GNU GRUB version 1.99-26
KALI LINUX
Debian GNU/Linux, with Linux 3.7-trunk-amd64
Debian GNU/Linux, with Linux 3.7-trunk-amd64 (recovery mode)
Windows 7 (loader) (on /dev/sda1)
Use the ↑ and ↓ keys to select which entry is highlighted.
Press enter to boot the selected OS, 'e' to edit the commands
before booting or 'c' for a command-line.

Post Installation

Now that you've completed installing Kali Linux, it's time to customize your system. The Kali General Use section of our site has more information and you can also find tips on how to get the most out of Kali in our User Forums.

Dual Boot Kali on Mac Hardware

Kali Linux Installation Requirements

Since the release of Kali Linux 1.0.8, Kali Linux supports EFI out of the box. This added feature simplifies the process of getting Kali installed and running on various Apple MacBook Air, Pro, and Retina models.

The make/model/year of the device will determine how successful your experience will be, with newer devices having a better chance of working. Pre-installing rEFInd may also increase the odds of success on older devices.

This guide will show you to dual-boot OSX with Kali Linux using rEFInd, with the option of encrypting the Kali Linux partition. If you wish to replace OSX completely, please refer to our Single Boot Kali on Mac Hardware guide.

By using using the 3rd party software rEFInd (a fork of rEFIt) we are able to open up the boot menu used in Apple's OSX OS, which is perfect for dual booting. It also has the advantage of helping older devices boot from USB that would not be able to otherwise. Once Kali Linux has been installed, rEFInd can be customized to be hidden or removed completely.

Installation Prerequisites

- A minimum of 20 GB disk space for the Kali Linux install.
- A minimum of 1 GB RAM. 2 GB or more recommended.
- Devices **older** than '**late 2012**', may require a blank DVD. **USB booting may not work without rEFInd** pre-installed.
- For devices **newer** than '**late 2012**', you'll need a blank DVD **or** a USB drive.
- OSX 10.7 or higher

Preparing for the Installation

1. Download Kali linux.
2. Burn the Kali Linux ISO image to a DVD or copy the image to USB drive.
3. Backup any important information on the device to external media.

Preparing OSX (Installing rEFInd)

1. At the time of this writing, the latest version of rEFInd is 0.8.3.
Boot into OSX and download a local copy.

```
osx:~ mbp$ curl -s -L http://sourceforge.net/projects/refind/files/0.8.3/refind-bin-0.8.3.zip -o refind.zip
```

2. After downloading rEFInd, extract the contents of the zip file and run the install shell script with sudo.

```
osx:~ mbp$ unzip -q refind.zip
osx:~ mbp$ cd refind-bin-*/
osx:refind-bin-0.8.3 mbp$ sudo bash install.sh

WARNING: Improper use of the sudo command could lead to data loss
or the deletion of important system files. Please double-check your
typing when using sudo. Type "man sudo" for more information.

To proceed, enter your password, or type Ctrl-C to abort.

Password:
Installing rEFInd on OS X....
Installing rEFInd to the partition mounted at //
Copied rEFInd binary files

Copying sample configuration file as refind.conf; edit this file to configure
rEFInd.

WARNING: If you have an Advanced Format disk, *DO NOT* attempt to check the
bless status with 'bless --info', since this is known to cause disk corruption
on some systems!!

Installation has completed successfully.

osx:refind-bin-0.8.3 mbp$
```

Kali Linux Partitioning Procedure

1. Before we can install Kali Linux, there needs to be room on the hard disk. By booting into a live Kali session, we can resize the partition to our desired size. To do so, power on the

device and immediately press and hold the **Option** key until you see the rEFInd boot menu.

2. When the boot menu appears, insert your chosen installation medium. If everything works as expected, you will see **two** volumes:

- EFI – EFI\BOOT\syslinux.efi from 61 MiB FAT volume
- Windows – Legacy OS from FAT volume

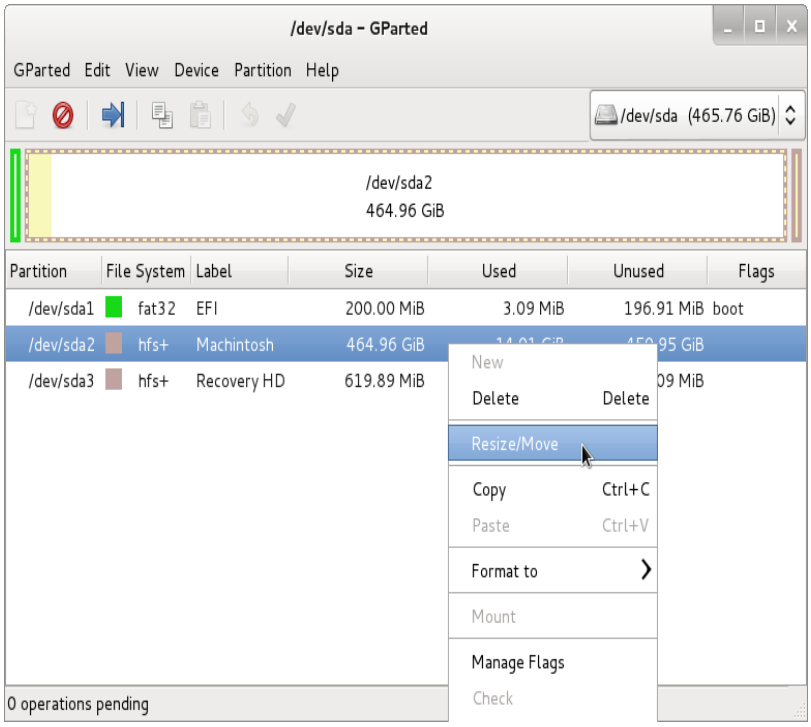
Although Kali Linux is based on Debian, Apple/rEFInd detects it as Windows. **Select the Windows volume to continue**.

- If you are using a DVD, you may need to refresh the menu by pressing **ESC**once the disk if fully spinning.
- If you still only see **one volume** (EFI), then the installation medium **is not supported** for your Apple device. If you haven't already done so, you may wish to install **rEFInd** and try again.
- If you select the EFI volume, the booting will hang at this point and you will **not** be able to continue.

3. You should be greeted with the Kali Boot screen. Select **Live** and you should be booted into the Kali Linux default desktop.

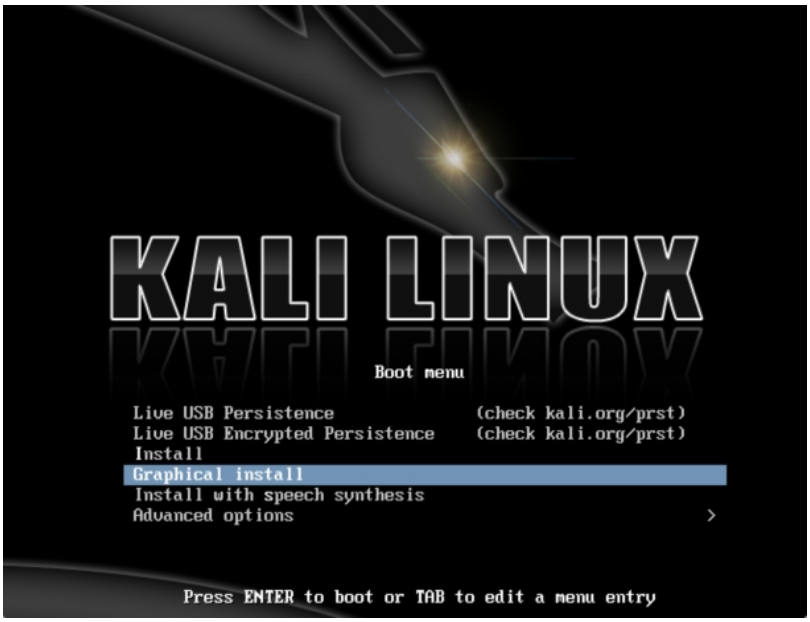
4. We can use GParted to shrink the existing OSX partition (HFS+), allowing us to install Kali in the free space. You can find GParted in the Kali menu by navigating to: Applications -> System Tools -> GParted Partition Editor

5. Once GParted has opened, select your OSX partition. Depending on your system, it will usually be the second, larger partition. In our example, there are three partitions: the EFI upgrade partition (/dev/sda1), OSX (/dev/sda2), and System Recovery (/dev/sda3). Resize your OSX partition and leave enough space (20 GB minimum) for the Kali installation.

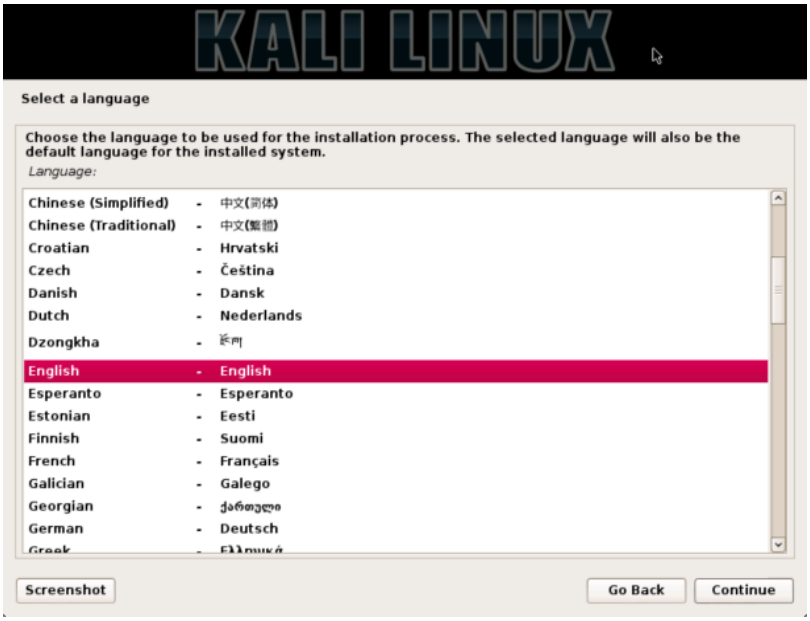


Kali Linux Installation Procedure

1. To start the Kali Linux installation, repeat steps 1 and 2 above to boot to the Kali Linux boot screen. Once you can see the the boot screen, choose ‘Live’, ‘Graphical Install’ or ‘(Text-Mode) Install’ to begin the setup. In this guide, we chose ‘Graphical Install’.

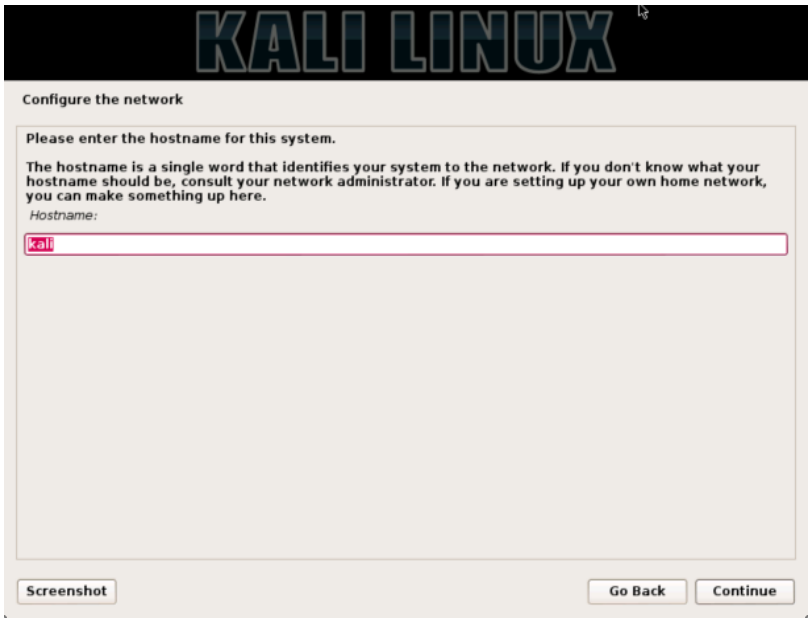


2. Select your preferred language and then your country location. You’ll also be prompted to configure your keyboard with the appropriate keymap.

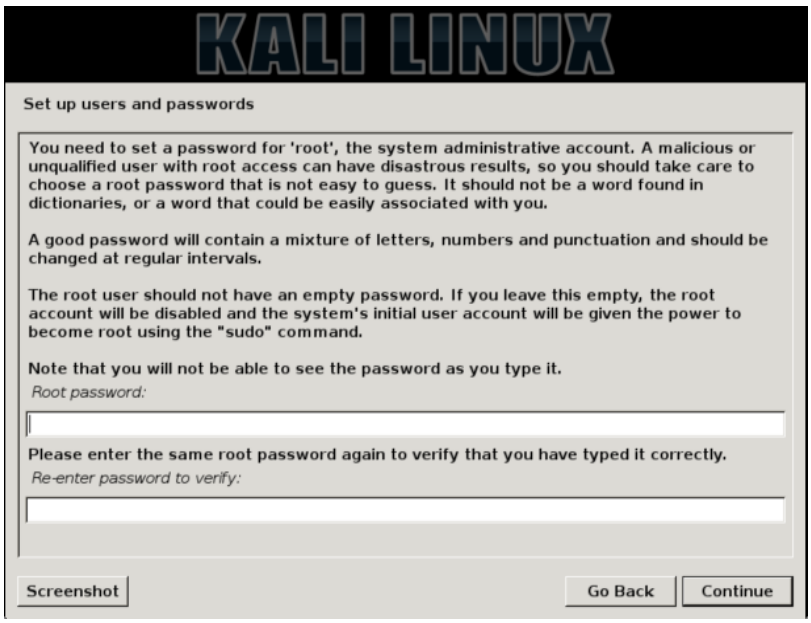


3. The installer will copy the image to your hard disk, probe your network interfaces, and then prompt you to enter a hostname then domain name for your system. In the example below, we’ve entered ‘kali’ as our hostname.

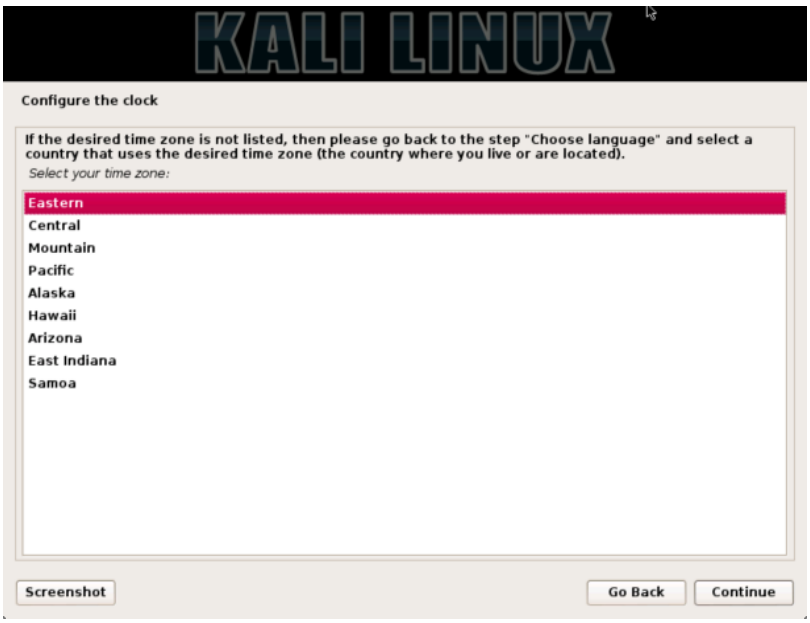
- If the setup detected multiple NICs, it may prompt you which one to use for installation.
- If the chosen NIC is 802.11 based, it will ask for wireless network information to collect, before prompting for a hostname.
- If there isn't a DHCP service running on the network, it will ask you to manually enter the network information after probing for network interfaces.
- If Kali Linux doesn't detect your NIC, you either need to include the drivers for it when prompted, or generate a custom Kali Linux ISO with them pre-included.


KALI LINUX
Configure the network
Please enter the hostname for this system.
The hostname is a single word that identifies your system to the network. If you don't know what your hostname should be, consult your network administrator. If you are setting up your own home network, you can make something up here.
Hostname:
kali
Screenshot
Go Back
Continue

4. Enter a robust password for the root account.


KALI LINUX
Set up users and passwords
You need to set a password for 'root', the system administrative account. A malicious or unqualified user with root access can have disastrous results, so you should take care to choose a root password that is not easy to guess. It should not be a word found in dictionaries, or a word that could be easily associated with you.
A good password will contain a mixture of letters, numbers and punctuation and should be changed at regular intervals.
The root user should not have an empty password. If you leave this empty, the root account will be disabled and the system's initial user account will be given the power to become root using the "sudo" command.
Note that you will not be able to see the password as you type it.
Root password:
Please enter the same root password again to verify that you have typed it correctly.
Re-enter password to verify:
Screenshot
Go Back
Continue

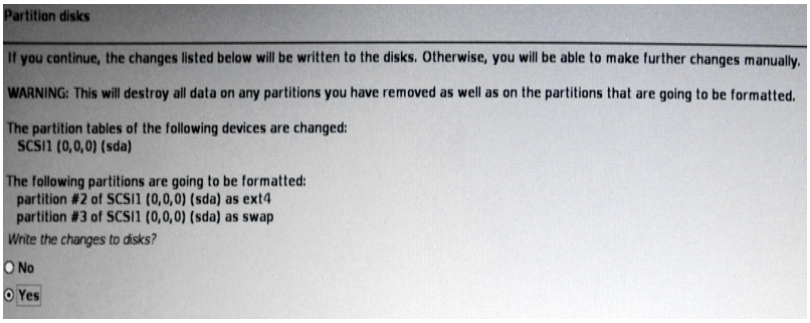
5. Next, set your time zone.



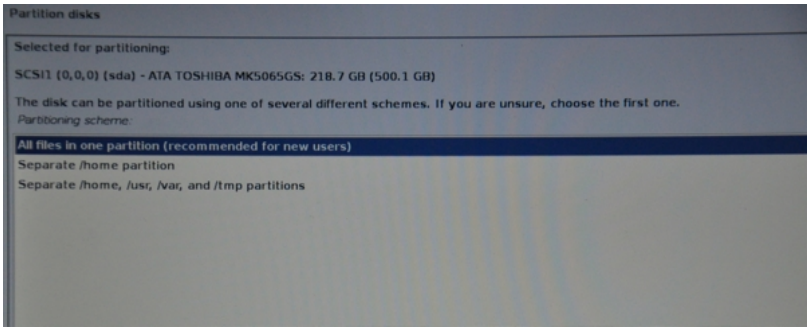
6. The installer will now probe your disks and offer you five choices. In our example, we're using the spare partition that we made during live mode, so we select 'Guided – use the largest continuous free space'.

- Experienced users can use the 'Manual' option for more granular configuration options. This option will also allow you to set up encrypted LVM, so Kali Linux would be fully encrypted. The screen afterwards will prompt you for the password. You will have to enter the same password every time you start up Kali Linux.

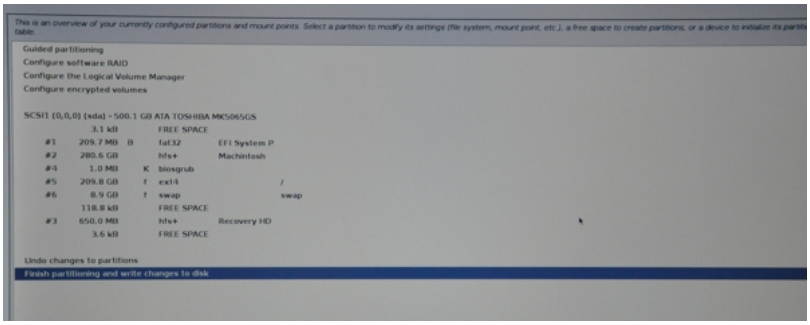
Kali will automatically securely wipe the hard disk before asking for the password. This may take 'a while' (hours) depending on size and speed of the drive. If you wish to risk it, you can skip it.


Partition disks
If you continue, the changes listed below will be written to the disks. Otherwise, you will be able to make further changes manually.
WARNING: This will destroy all data on any partitions you have removed as well as on the partitions that are going to be formatted.
The partition tables of the following devices are changed:
SCSI1 (0,0,0) (sda)
The following partitions are going to be formatted:
partition #2 of SCSI1 (0,0,0) (sda) as ext4
partition #3 of SCSI1 (0,0,0) (sda) as swap
Write the changes to disks?
No
Yes

7. The next stage is to select the partition structure you want to use. We will go ahead and use the default option and have everything on one partition. Afterwards it will display an overview. If you agree to what it suggests, press the continue button.

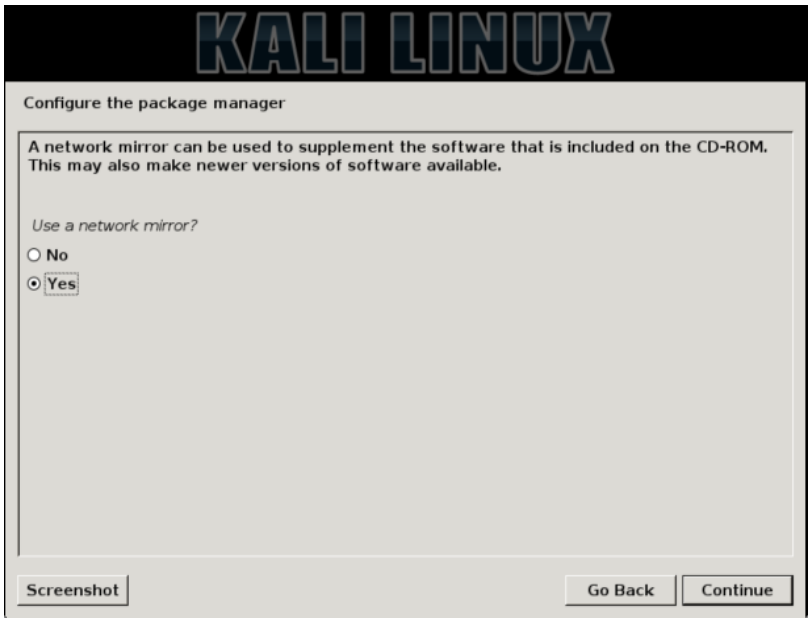

Partition disks
Selected for partitioning:
SCSI1 (0,0,0) (sda) - ATA TOSHIBA MK5065GS: 218.7 GB (500.1 GB)
The disk can be partitioned using one of several different schemes. If you are unsure, choose the first one.
Partitioning scheme:
All files in one partition (recommended for new users)
Separate /home partition
Separate /home, /usr, /var, and /tmp partitions

8. Next, you'll have one last chance to review your disk configuration before the installer makes irreversible changes. After you click Continue, the installer will go to work and you'll have an almost finished installation.

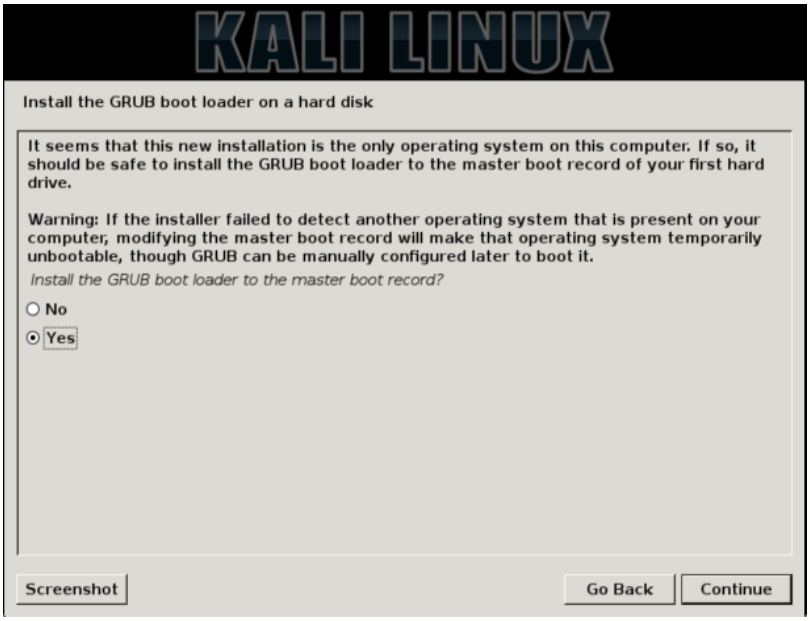

Guided partitioning
Configure software RAID
Configure the Logical Volume Manager
Configure encrypted volumes
Undo changes to partitions
Finish partitioning and write changes to disk

9. This screen configures the use of our Internet network mirrors. Kali can use our online central repository to distribute applications to keep packages up-to-date and allow for additional programs to be installed more easily. Should you need to enter any appropriate proxy information, the next screen will allow you to enter the required details.

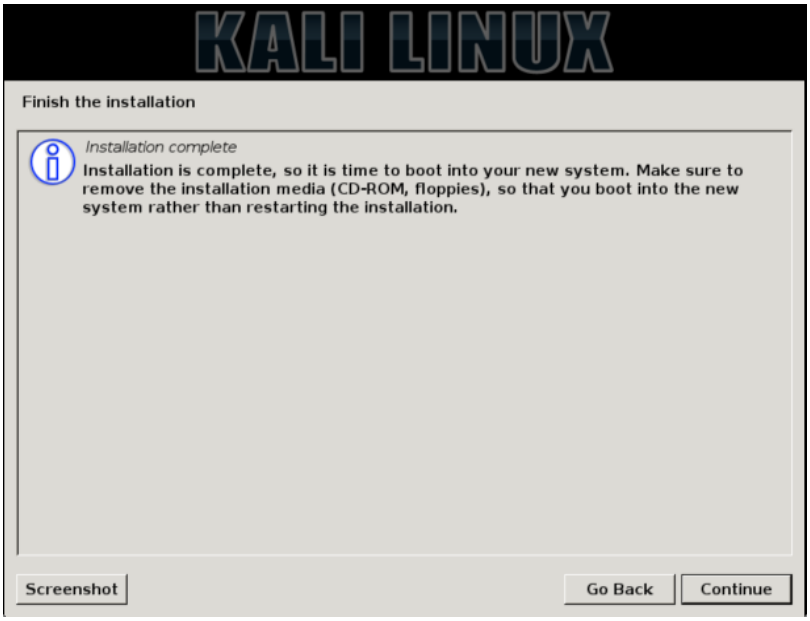
If you select 'NO' in this screen, you will NOT be able to install packages from Kali repositories until you alter your sources.


KALI LINUX
Configure the package manager
A network mirror can be used to supplement the software that is included on the CD-ROM. This may also make newer versions of software available.
Use a network mirror?
No
Yes
Screenshot
Go Back
Continue

10.Next, install GRUB bootloader.


KALI LINUX
Install the GRUB boot loader on a hard disk
It seems that this new installation is the only operating system on this computer. If so, it should be safe to install the GRUB boot loader to the master boot record of your first hard drive.
Warning: If the installer failed to detect another operating system that is present on your computer, modifying the master boot record will make that operating system temporarily unbootable, though GRUB can be manually configured later to boot it.
Install the GRUB boot loader to the master boot record?
No
Yes
Screenshot
Go Back
Continue

11.Finally, click ‘Continue’ to finish installing Kali Linux. It is highly recommend that you restart your machine at this stage.
Once complete, repeat the first 2 steps again to boot into ‘Live mode’ once more.


KALI LINUX
Finish the installation
Installation complete
Installation is complete, so it is time to boot into your new system. Make sure to remove the installation media (CD-ROM, floppies), so that you boot into the new system rather than restarting the installation.
Screenshot
Go Back
Continue

12.If the gdisk package isn’t included in your Kali Linux ISO, you will first need to install it.
If you enabled the network repository during the setup, this can easily be done:

```
apt-get update
apt-get install gdisk
```

13.We are now going to convert the Master Boot Record (MBR) to a hybrid, which will allow for Apple's EFI to detect and boot using GRUB.
Once complete, power off the device and remove any installation media when prompted.

```
root@kali:~# gdisk /dev/sda
GPT fdisk (gdisk) version 0.8.5

Partition table scan:
MBR: protective
BSD: not present
APM: not present
GPT: present

Found valid GPT with protective MBR; using GPT.

Command (? for help): p
Disk /dev/sda: 976773168 sectors, 465.8 GiB
Logical sector size: 512 bytes
Disk identifier (GUID): 1B3DB3D4-ECFD-47A1-9435-F2FF318C2F55
Partition table holds up to 128 entries
First usable sector is 34, last usable sector is 976773134
Partitions will be aligned on 8-sector boundaries
Total free space is 245 sectors (122.5 KiB)

Number Start (sector) End (sector) Size Code Name
1 40 409639 200.0 MiB EF00 EFI System Partition
2 409640 548413439 261.3 GiB AF00 Macintosh
3 975503592 976773127 619.9 MiB AB00 Recovery HD
4 548413440 548415487 1024.0 KiB EF02
5 548415488 958138367 195.4 GiB 0700
6 958138368 975503359 8.3 GiB 8200

Command (? for help): r

Recovery/transformation command (? for help): h

WARNING! Hybrid MBRs are flaky and dangerous! If you decide not to use one,
just hit the Enter key at the below prompt and your MBR partition table will
be untouched.
```

Type from one to three GPT partition numbers, separated by spaces, to be added to the hybrid MBR, in sequence: 5
Place EFI GPT (0xEE) partition first in MBR (good for GRUB)? (Y/N): y

Creating entry for GPT partition #5 (MBR partition #2)
Enter an MBR hex code (default 07): 83
Set the bootable flag? (Y/N): y

Unused partition space(s) found. Use one to protect more partitions? (Y/N): n

Recovery/transformation command (? for help): w

Final checks complete. About to write GPT data. THIS WILL OVERWRITE EXISTING PARTITIONS!!

Do you want to proceed? (Y/N): y
OK; writing new GUID partition table (GPT) to /dev/sda.
The operation has completed successfully.
root@kali:~#

14.At this stage, we are able to use both Kali Linux and OSX and select which one we want to use at start up.

rEFInd Configuration

If you wish, you can alter rEFInd in various ways now, including:

- The default OS selection (by default it is OSX)
- Timeout value (by default it is 20 seconds)
- Direct boot into the default OS (Note, by pressing **Options** during boot, you will have a one time boot menu)
- Remove rEFInd, enabling the use of the traditional Apple menu (booting to OSX and Kali Linux will still work)

If you wish to make any of these alterations, boot into OSX, and alter the following file:

```
osx:~ mbp$ sudo nano /EFI/refind/refind.conf
```

- The timeout value controls how long you have to select an OS from the boot menu. By setting it to '-1', it will boot directly into the default OS.

```
# Timeout in seconds for the main menu screen. Setting the timeout to 0
# disables automatic booting (i.e., no timeout). Setting it to -1 causes
# an immediate boot to the default OS *UNLESS* a keypress is in the buffer
# when rEFInd launches, in which case that keypress is interpreted as a
# shortcut key. If no matching shortcut is found, rEFInd displays its
# menu with no timeout.
#
timeout -1
```

- The 'default_selection' value sets the default selection on startup. OSX will be at position '1' and Kali will be at '2'. In this example, we will use OSX as the default.

```
# Set the default menu selection.  The available arguments match the
# keyboard accelerators available within rEFInd.  You may select the
# default loader using:
#  - A digit between 1 and 9, in which case the Nth loader in the menu
#    will be the default.
#  - A "+" symbol at the start of the string, which refers to the most
#    recently booted loader.
#  - Any substring that corresponds to a portion of the loader's title
#    (usually the OS's name or boot loader's path).
# You may also specify multiple selectors by separating them with commas
# and enclosing the list in quotes. (The "+" option is only meaningful in
# this context.)
# If you follow the selector(s) with two times, in 24-hour format, the
# default will apply only between those times. The times are in the
# motherboard's time standard, whether that's UTC or local time, so if
# you use UTC, you'll need to adjust this from local time manually.
# Times may span midnight as in "23:30 00:30", which applies to 11:30 PM
# to 12:30 AM. You may specify multiple default_selection lines, in which
# case the last one to match takes precedence. Thus, you can set a main
# option without a time followed by one or more that include times to
# set different defaults for different times of day.
# The default behavior is to boot the previously-booted OS.
#
default_selection 1
```

- If we combine the two alterations and save our changes, the next time we reboot, it will appear that nothing has changed from before installing Kali Linux. However, if we hold down the 'Options' key for the Apple boot menu, we will see the following:
  - EFI Boot – OSX

- Windows – Kali Linux
- Recovery HD – OSX's Recovery Partition

Using Apple's boot menu, the value names cannot be altered. If you wish to customize these values, you will need to use rEFInd.

Dual Boot Kali on Mac Hardware

/03. Installing Kali Linux /Dual Boot Kali on Mac Hardware

Kali Linux Installation Requirements

Since the release of Kali Linux 1.0.8, Kali Linux supports EFI out of the box. This added feature simplifies the process of getting Kali installed and running on various Apple MacBook Air, Pro, and Retina models.

The make/model/year of the device will determine how successful your experience will be, with newer devices having a better chance of working. Pre-installing rEFInd may also increase the odds of success on older devices.

This guide will show you to dual-boot OSX with Kali Linux using rEFInd, with the option of encrypting the Kali Linux partition. If you wish to replace OSX completely, please refer to our Single Boot Kali on Mac Hardware guide.

By using using the 3rd party software rEFInd (a fork of rEFIt) we are able to open up the boot menu used in Apple's OSX OS, which is perfect for dual booting. It also has the advantage of

helping older devices boot from USB that would not be able to otherwise. Once Kali Linux has been installed, rEFInd can be customized to be hidden or removed completely.

Installation Prerequisites

- A minimum of 20 GB disk space for the Kali Linux install.
- A minimum of 1 GB RAM. 2 GB or more recommended.
- Devices **older** than '**late 2012**', may require a blank DVD. **USB booting may not work without rEFInd** pre-installed.
- For devices **newer** than '**late 2012**', you'll need a blank DVD **or** a USB drive.
- OSX 10.7 or higher

Preparing for the Installation

1. Download Kali linux.
2. Burn the Kali Linux ISO image to a DVD or copy the image to USB drive.
3. Backup any important information on the device to external media.

Preparing OSX (Installing rEFInd)

1. At the time of this writing, the latest version of rEFInd is 0.8.3.
   Boot into OSX and download a local copy.

```
osx:~ mbp$ curl -s -L http://sourceforge.net/projects/refind/files/0.8.3/refind-bin-0.8.3.zip -o refind.zip
```

2. After downloading rEFInd, extract the contents of the zip file and run the install shell script with sudo.

```
osx:~ mbp$ unzip -q refind.zip
osx:~ mbp$ cd refind-bin-*/
osx:refind-bin-0.8.3 mbp$ sudo bash install.sh
```

WARNING: Improper use of the sudo command could lead to data loss or the deletion of important system files. Please double-check your typing when using sudo. Type "man sudo" for more information.

To proceed, enter your password, or type Ctrl-C to abort.

Password:
Installing rEFInd on OS X....
Installing rEFInd to the partition mounted at //
Copied rEFInd binary files

Copying sample configuration file as refind.conf; edit this file to configure rEFInd.

WARNING: If you have an Advanced Format disk, *DO NOT* attempt to check the bless status with 'bless --info', since this is known to cause disk corruption on some systems!!

Installation has completed successfully.

osx:refind-bin-0.8.3 mbp$

Kali Linux Partitioning Procedure

1. Before we can install Kali Linux, there needs to be room on the hard disk. By booting into a live Kali session, we can resize the partition to our desired size. To do so, power on the device and immediately press and hold the **Option** key until you see the rEFInd boot menu.

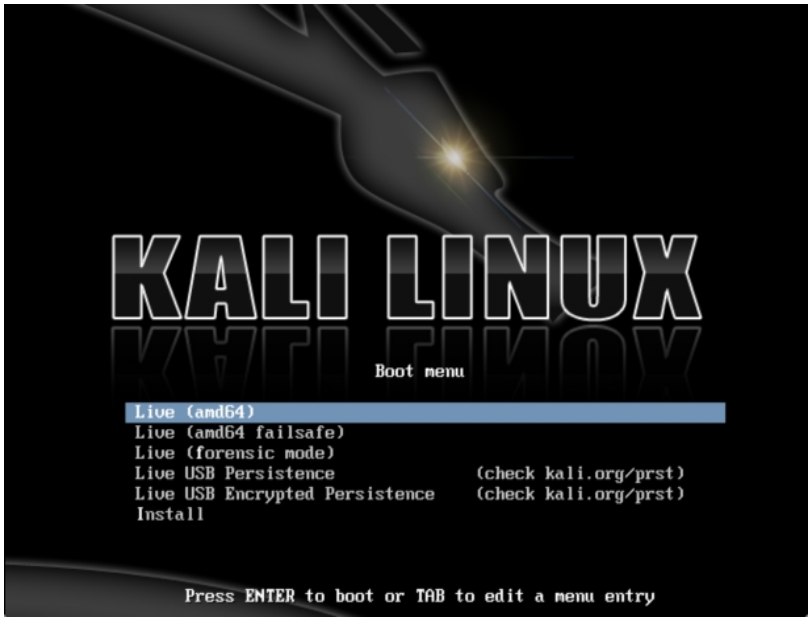
2. When the boot menu appears, insert your chosen installation medium. If everything works as expected, you will see **two** volumes:

- EFI – EFI\BOOT\syslinux.efi from 61 MiB FAT volume
- Windows – Legacy OS from FAT volume

Although Kali Linux is based on Debian, Apple/rEFInd detects it as Windows. **Select the Windows volume to continue**.

- If you are using a DVD, you may need to refresh the menu by pressing **ESC**once the disk if fully spinning.
- If you still only see **one volume** (EFI), then the installation medium **is not supported** for your Apple device. If you haven't already done so, you may wish to install **rEFInd** and try again.
- If you select the EFI volume, the booting will hang at this point and you will **not** be able to continue.

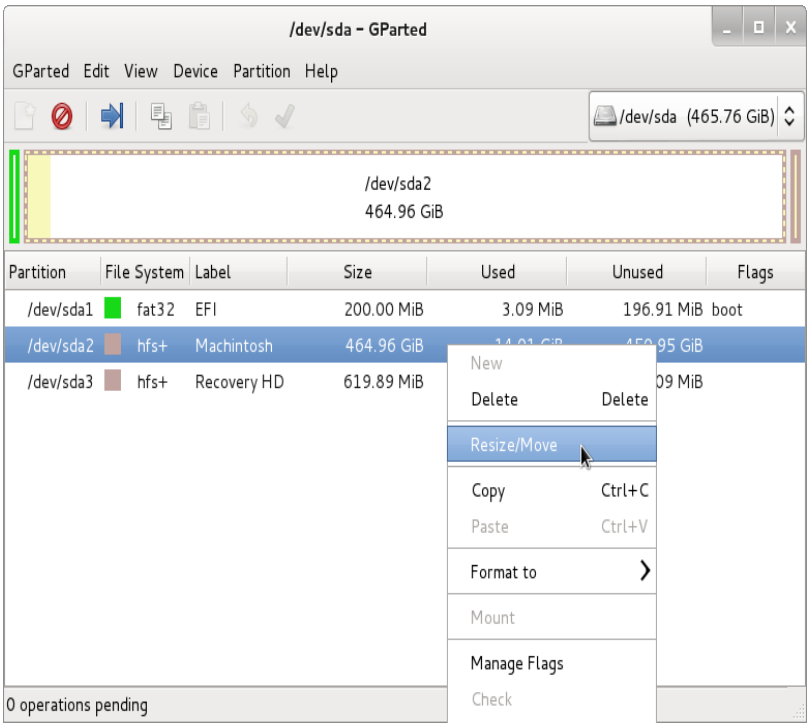
3. You should be greeted with the Kali Boot screen. Select **Live** and you should be booted into the Kali Linux default desktop.



4. We can use GParted to shrink the existing OSX partition (HFS+), allowing us to install Kali in the free space. You can find GParted in the Kali menu by navigating to: Applications -> System Tools -> GParted Partition Editor

5. Once GParted has opened, select your OSX partition. Depending on your system, it will usually be the second, larger partition. In our example, there are three partitions: the EFI

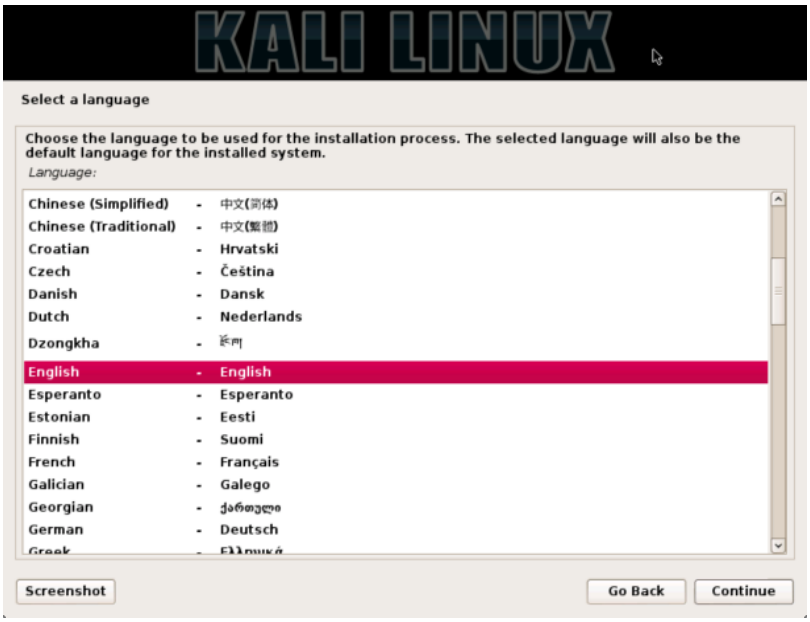
upgrade partition (/dev/sda1), OSX (/dev/sda2), and System Recovery (/dev/sda3). Resize your OSX partition and leave enough space (20 GB minimum) for the Kali installation.



Kali Linux Installation Procedure

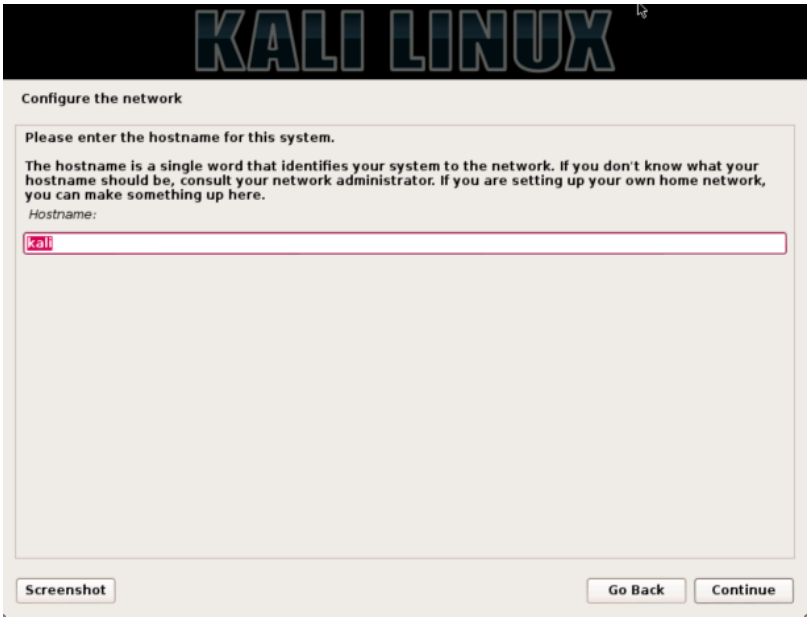
1. To start the Kali Linux installation, repeat steps 1 and 2 above to boot to the Kali Linux boot screen. Once you can see the the boot screen, choose ‘Live’, ‘Graphical Install’ or ‘(Text-Mode) Install’ to begin the setup. In this guide, we chose ‘Graphical Install’.

2. Select your preferred language and then your country location. You'll also be prompted to configure your keyboard with the appropriate keymap.

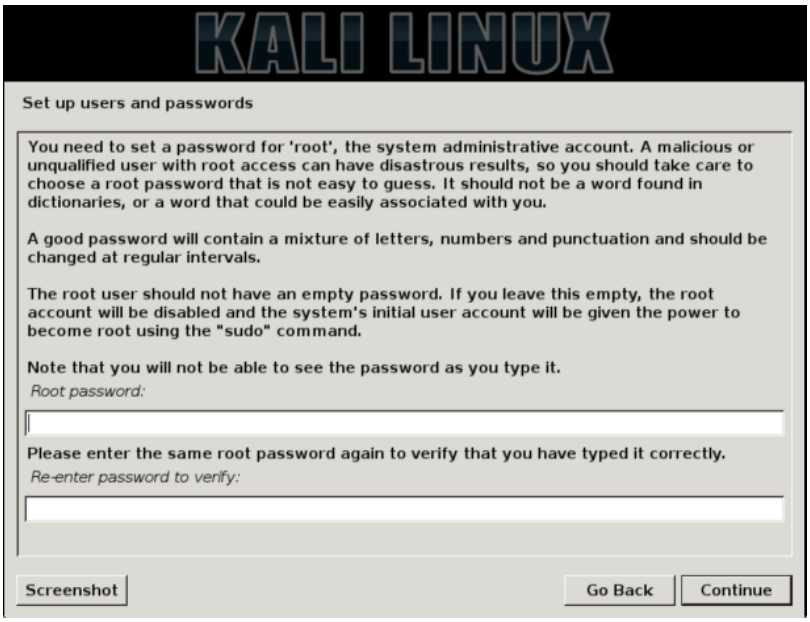


3. The installer will copy the image to your hard disk, probe your network interfaces, and then prompt you to enter a hostname then domain name for your system. In the example below, we've entered 'kali' as our hostname.

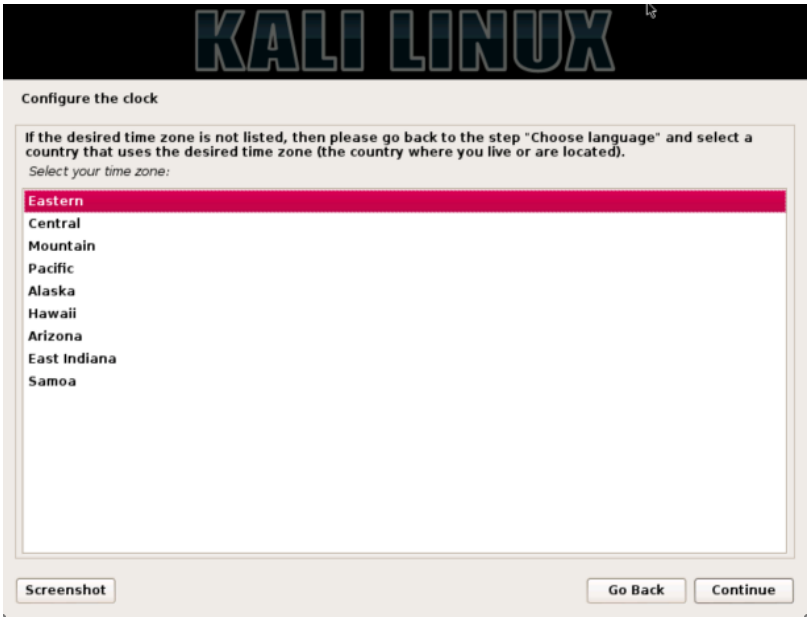
- If the setup detected multiple NICs, it may prompt you which one to use for installation.
- If the chosen NIC is 802.11 based, it will ask for wireless network information to collect, before prompting for a hostname.
- If there isn't a DHCP service running on the network, it will ask you to manually enter the network information after probing for network interfaces.
- If Kali Linux doesn't detect your NIC, you either need to include the drivers for it when prompted, or generate a custom Kali Linux ISO with them pre-included.


KALI LINUX
Configure the network
Please enter the hostname for this system.
The hostname is a single word that identifies your system to the network. If you don't know what your hostname should be, consult your network administrator. If you are setting up your own home network, you can make something up here.
Hostname:
kali
Screenshot
Go Back
Continue

4. Enter a robust password for the root account.


KALI LINUX
Set up users and passwords
You need to set a password for 'root', the system administrative account. A malicious or unqualified user with root access can have disastrous results, so you should take care to choose a root password that is not easy to guess. It should not be a word found in dictionaries, or a word that could be easily associated with you.
A good password will contain a mixture of letters, numbers and punctuation and should be changed at regular intervals.
The root user should not have an empty password. If you leave this empty, the root account will be disabled and the system's initial user account will be given the power to become root using the "sudo" command.
Note that you will not be able to see the password as you type it.
Root password:
Please enter the same root password again to verify that you have typed it correctly.
Re-enter password to verify:
Screenshot
Go Back
Continue

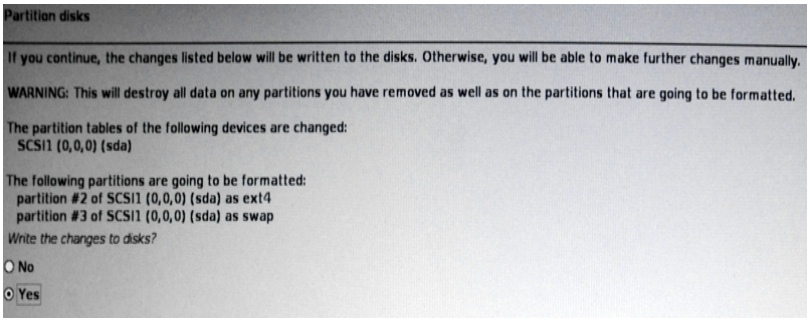
5. Next, set your time zone.



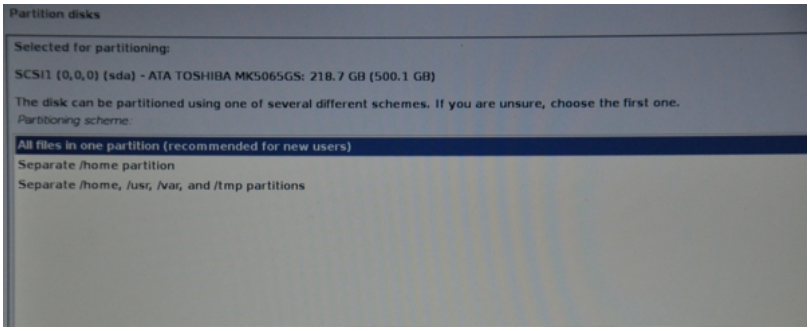
6. The installer will now probe your disks and offer you five choices. In our example, we're using the spare partition that we made during live mode, so we select 'Guided – use the largest continuous free space'.

   - Experienced users can use the 'Manual' option for more granular configuration options. This option will also allow you to set up encrypted LVM, so Kali Linux would be fully encrypted. The screen afterwards will prompt you for the password. You will have to enter the same password every time you start up Kali Linux.

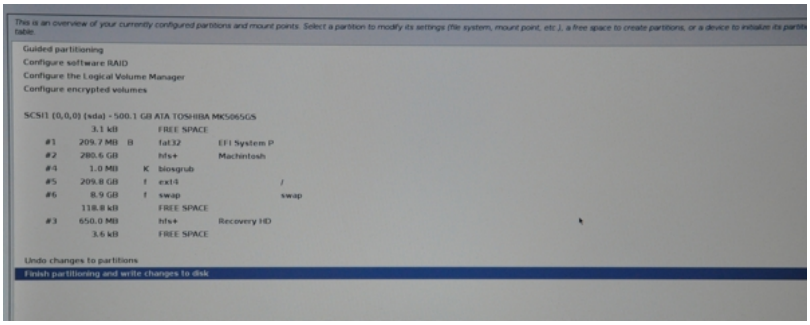
Kali will automatically securely wipe the hard disk before asking for the password. This may take 'a while' (hours) depending on size and speed of the drive. If you wish to risk it, you can skip it.


Partition disks
If you continue, the changes listed below will be written to the disks. Otherwise, you will be able to make further changes manually.
WARNING: This will destroy all data on any partitions you have removed as well as on the partitions that are going to be formatted.
The partition tables of the following devices are changed:
SCSI1 (0,0,0) (sda)
The following partitions are going to be formatted:
partition #2 of SCSI1 (0,0,0) (sda) as ext4
partition #3 of SCSI1 (0,0,0) (sda) as swap
Write the changes to disks?
No
Yes

7. The next stage is to select the partition structure you want to use. We will go ahead and use the default option and have everything on one partition. Afterwards it will display an overview. If you agree to what it suggests, press the continue button.

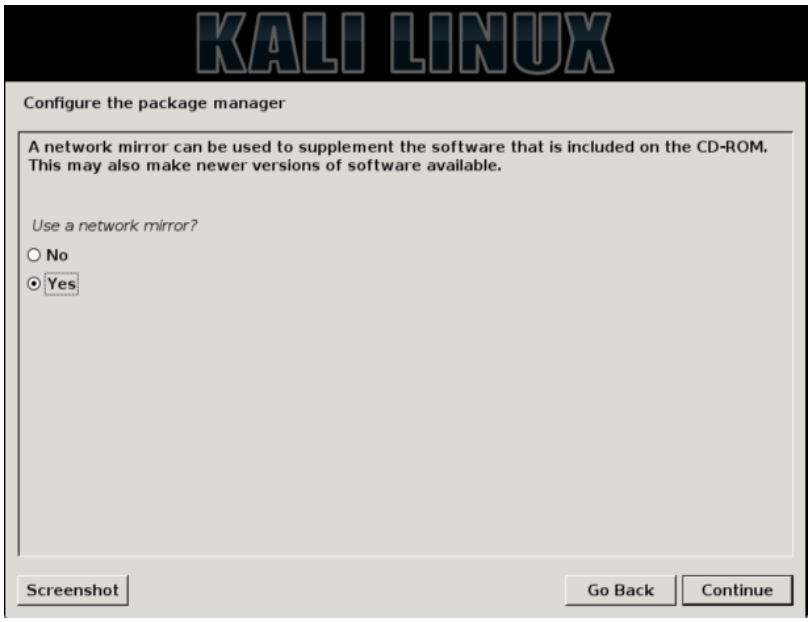

Partition disks
Selected for partitioning:
SCSI1 (0,0,0) (sda) - ATA TOSHIBA MK5065GS: 218.7 GB (500.1 GB)
The disk can be partitioned using one of several different schemes. If you are unsure, choose the first one.
Partitioning scheme:
All files in one partition (recommended for new users)
Separate /home partition
Separate /home, /usr, /var, and /tmp partitions

8. Next, you'll have one last chance to review your disk configuration before the installer makes irreversible changes. After you click Continue, the installer will go to work and you'll have an almost finished installation.

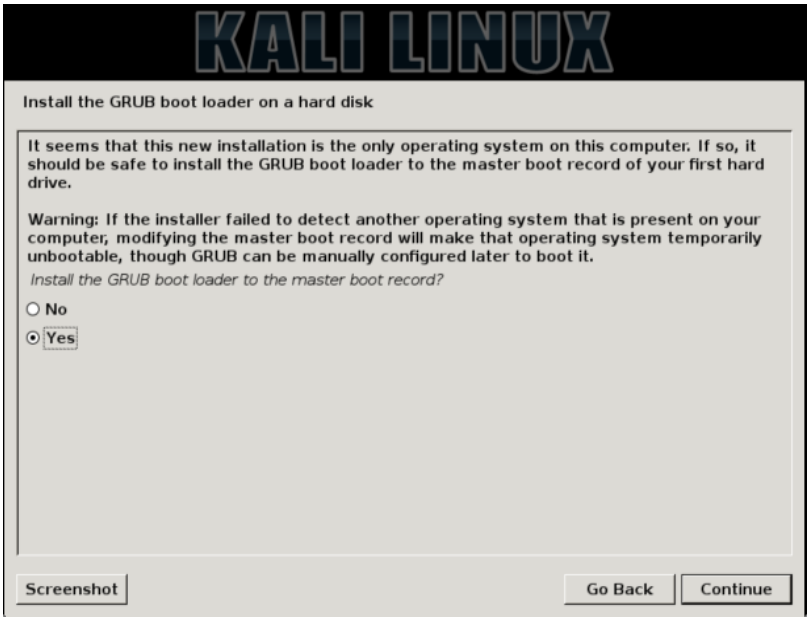

Guided partitioning
Configure software RAID
Configure the Logical Volume Manager
Configure encrypted volumes
Undo changes to partitions
Finish partitioning and write changes to disk

9. This screen configures the use of our Internet network mirrors. Kali can use our online central repository to distribute applications to keep packages up-to-date and allow for additional programs to be installed more easily. Should you need to enter any appropriate proxy information, the next screen will allow you to enter the required details.

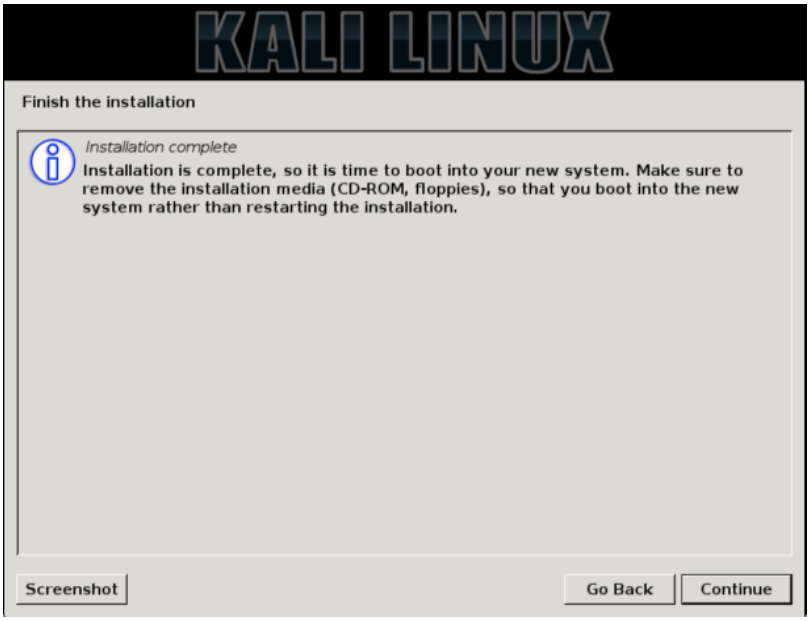
If you select 'NO' in this screen, you will NOT be able to install packages from Kali repositories until you alter your sources.


KALI LINUX
Configure the package manager
A network mirror can be used to supplement the software that is included on the CD-ROM. This may also make newer versions of software available.
Use a network mirror?
No
Yes
Screenshot
Go Back
Continue

10.Next, install GRUB bootloader.


KALI LINUX
Install the GRUB boot loader on a hard disk
It seems that this new installation is the only operating system on this computer. If so, it should be safe to install the GRUB boot loader to the master boot record of your first hard drive.
Warning: If the installer failed to detect another operating system that is present on your computer, modifying the master boot record will make that operating system temporarily unbootable, though GRUB can be manually configured later to boot it.
Install the GRUB boot loader to the master boot record?
No
Yes
Screenshot
Go Back
Continue

11.Finally, click ‘Continue’ to finish installing Kali Linux. It is highly recommend that you restart your machine at this stage.
Once complete, repeat the first 2 steps again to boot into ‘Live mode’ once more.


KALI LINUX
Finish the installation
Installation complete
Installation is complete, so it is time to boot into your new system. Make sure to remove the installation media (CD-ROM, floppies), so that you boot into the new system rather than restarting the installation.
Screenshot
Go Back
Continue

12.If the gdisk package isn’t included in your Kali Linux ISO, you will first need to install it.
If you enabled the network repository during the setup, this can easily be done:

```
apt-get update
apt-get install gdisk
```

13.We are now going to convert the Master Boot Record (MBR) to a hybrid, which will allow for Apple's EFI to detect and boot using GRUB.
Once complete, power off the device and remove any installation media when prompted.

```
root@kali:~# gdisk /dev/sda
GPT fdisk (gdisk) version 0.8.5

Partition table scan:
MBR: protective
BSD: not present
APM: not present
GPT: present

Found valid GPT with protective MBR; using GPT.

Command (? for help): p
Disk /dev/sda: 976773168 sectors, 465.8 GiB
Logical sector size: 512 bytes
Disk identifier (GUID): 1B3DB3D4-ECFD-47A1-9435-F2FF318C2F55
Partition table holds up to 128 entries
First usable sector is 34, last usable sector is 976773134
Partitions will be aligned on 8-sector boundaries
Total free space is 245 sectors (122.5 KiB)

Number Start (sector) End (sector) Size Code Name
1 40 409639 200.0 MiB EF00 EFI System Partition
2 409640 548413439 261.3 GiB AF00 Macintosh
3 975503592 976773127 619.9 MiB AB00 Recovery HD
4 548413440 548415487 1024.0 KiB EF02
5 548415488 958138367 195.4 GiB 0700
6 958138368 975503359 8.3 GiB 8200

Command (? for help): r

Recovery/transformation command (? for help): h

WARNING! Hybrid MBRs are flaky and dangerous! If you decide not to use one,
just hit the Enter key at the below prompt and your MBR partition table will
be untouched.
```

Type from one to three GPT partition numbers, separated by spaces, to be added to the hybrid MBR, in sequence: 5
Place EFI GPT (0xEE) partition first in MBR (good for GRUB)? (Y/N): y

Creating entry for GPT partition #5 (MBR partition #2)
Enter an MBR hex code (default 07): 83
Set the bootable flag? (Y/N): y

Unused partition space(s) found. Use one to protect more partitions? (Y/N): n

Recovery/transformation command (? for help): w

Final checks complete. About to write GPT data. THIS WILL OVERWRITE EXISTING PARTITIONS!!

Do you want to proceed? (Y/N): y
OK; writing new GUID partition table (GPT) to /dev/sda.
The operation has completed successfully.
root@kali:~#

14.At this stage, we are able to use both Kali Linux and OSX and select which one we want to use at start up.

rEFInd Configuration

If you wish, you can alter rEFInd in various ways now, including:

- The default OS selection (by default it is OSX)
- Timeout value (by default it is 20 seconds)
- Direct boot into the default OS (Note, by pressing **Options** during boot, you will have a one time boot menu)
- Remove rEFInd, enabling the use of the traditional Apple menu (booting to OSX and Kali Linux will still work)

If you wish to make any of these alterations, boot into OSX, and alter the following file:

```
osx:~ mbp$ sudo nano /EFI/refind/refind.conf
```

- The timeout value controls how long you have to select an OS from the boot menu. By setting it to '-1', it will boot directly into the default OS.

```
# Timeout in seconds for the main menu screen. Setting the timeout to 0
# disables automatic booting (i.e., no timeout). Setting it to -1 causes
# an immediate boot to the default OS *UNLESS* a keypress is in the buffer
# when rEFInd launches, in which case that keypress is interpreted as a
# shortcut key. If no matching shortcut is found, rEFInd displays its
# menu with no timeout.
#
timeout -1
```

- The 'default_selection' value sets the default selection on startup. OSX will be at position '1' and Kali will be at '2'. In this example, we will use OSX as the default.

```
# Set the default menu selection.  The available arguments match the
# keyboard accelerators available within rEFInd.  You may select the
# default loader using:
#  - A digit between 1 and 9, in which case the Nth loader in the menu
#    will be the default.
#  - A "+" symbol at the start of the string, which refers to the most
#    recently booted loader.
#  - Any substring that corresponds to a portion of the loader's title
#    (usually the OS's name or boot loader's path).
# You may also specify multiple selectors by separating them with commas
# and enclosing the list in quotes. (The "+" option is only meaningful in
# this context.)
# If you follow the selector(s) with two times, in 24-hour format, the
# default will apply only between those times. The times are in the
# motherboard's time standard, whether that's UTC or local time, so if
# you use UTC, you'll need to adjust this from local time manually.
# Times may span midnight as in "23:30 00:30", which applies to 11:30 PM
# to 12:30 AM. You may specify multiple default_selection lines, in which
# case the last one to match takes precedence. Thus, you can set a main
# option without a time followed by one or more that include times to
# set different defaults for different times of day.
# The default behavior is to boot the previously-booted OS.
#
default_selection 1
```

- If we combine the two alterations and save our changes, the next time we reboot, it will appear that nothing has changed from before installing Kali Linux. However, if we hold down the 'Options' key for the Apple boot menu, we will see the following:
  - EFI Boot – OSX

- Windows – Kali Linux
- Recovery HD – OSX's Recovery Partition

Using Apple's boot menu, the value names cannot be altered. If you wish to customize these values, you will need to use rEFInd.

Single Boot Kali on Mac Hardware

/03. Installing Kali Linux /Single Boot Kali on Mac Hardware

Kali Linux Installation Requirements

Since the release of Kali Linux 1.0.8, Kali Linux supports EFI out of the box. This added feature simplifies the process of getting Kali installed and running on various Apple MacBook Air, Pro, and Retina models.

The make/model/year of the device will determine how successful your experience will be, with newer devices having a better chance of working. Pre-installing rEFInd may also increase the odds of success on older devices.

This guide will show you to **replace** OSX with Kali Linux, with the option of encrypting the partition. However, if you wish to keep OSX, you will want to refer to our dual-boot guide instead.

Installation Prerequisites

- A minimum of 20 GB disk space for the Kali Linux install.

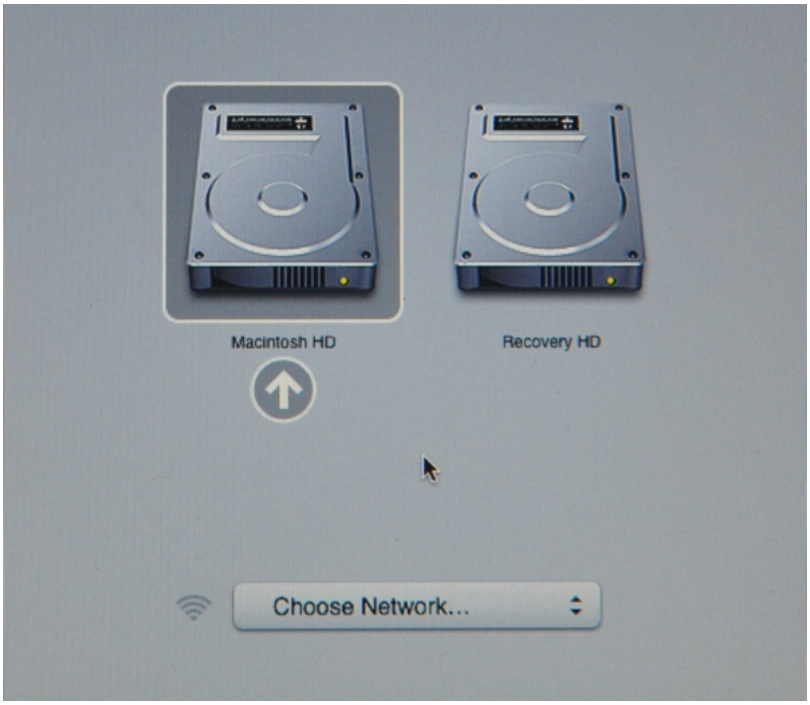
- A minimum of 1 GB RAM. 2 GB or more recommended.
- For devices **older** than **late 2012**, you will need a blank DVD.
  - **USB booting may not work without rEFInd** installed.
- For devices **newer** than **late 2012**, you'll need a blank DVD **or** a USB drive.
  - OSX 10.7 or higher.

Preparing for the Installation

1. Download Kali linux.
2. Burn the Kali Linux ISO image to a DVD or copy the image to USB drive.
3. Backup any important information on the device to an external media.

Kali Linux Installation Procedure

1. To start your installation, power on the device and immediately press and hold the **Option** key until you see the boot menu.



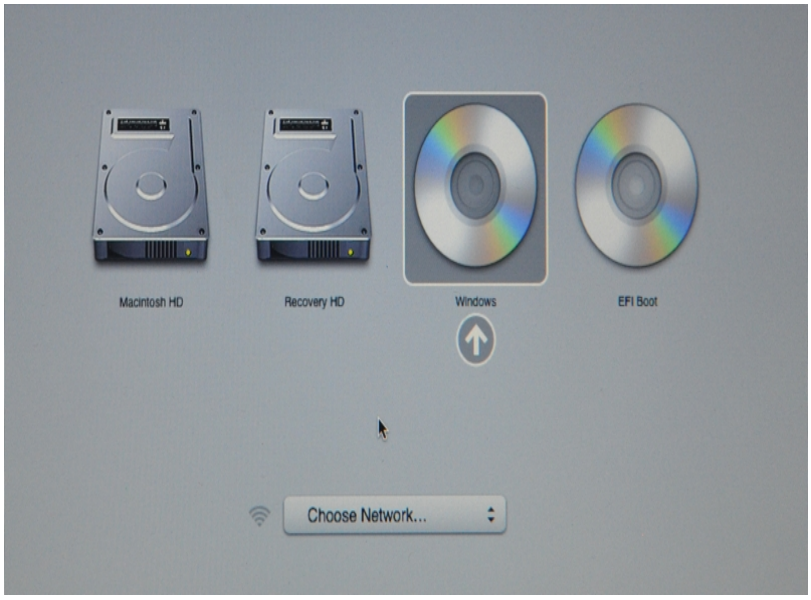
2. Now insert your chosen installation media. If everything was successful, you will see **two** volumes (EFI & Windows). Even though Kali Linux is based on Debian, Apple detects it as Windows.

Select the **Windows** volume to continue.

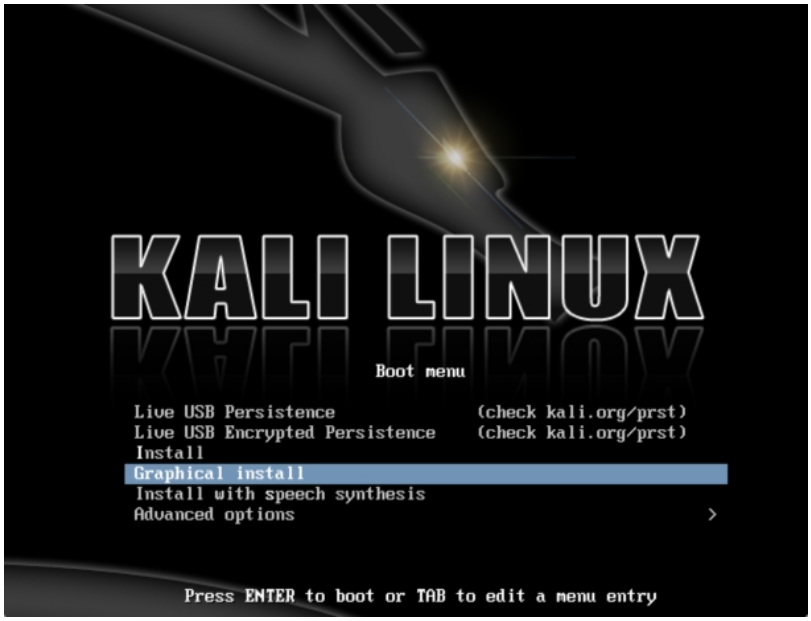
- If you only see **one volume** (EFI), then the installation media **is not supported**for this device.

  You may wish to install **rEFInd** and try again.

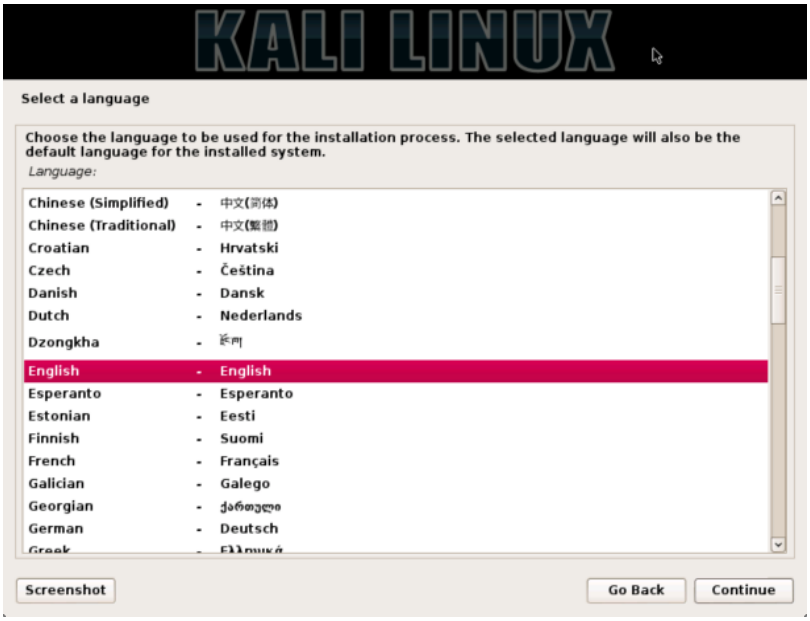
- If you select the EFI volume, the booting will hang at this point and you will **not** be able to continue.



3. You should be greeted with the Kali boot screen. You are free to choose ‘Live’, ‘Graphical Install’, or ‘(Text-Mode) Install’ to install. In this example, we picked ‘Graphical install’.

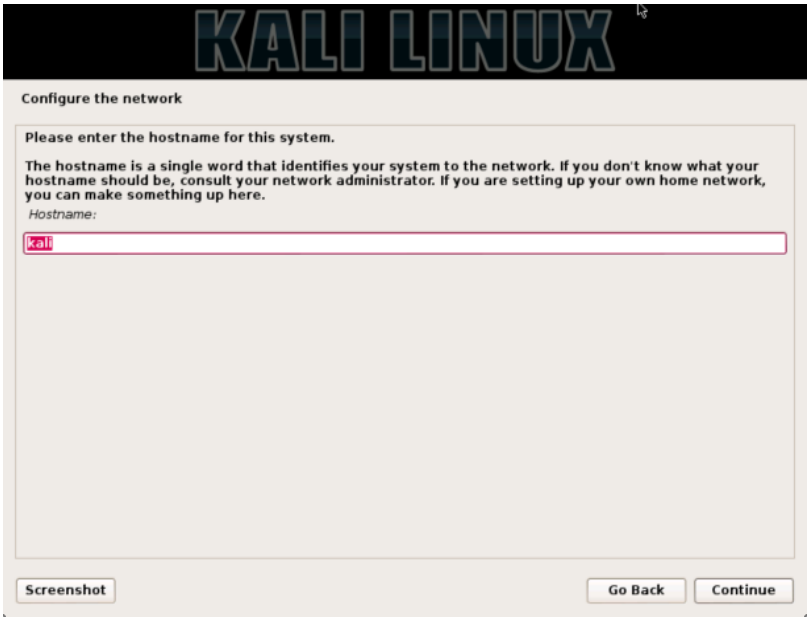


4. Select your preferred language and then your country location. You’ll also be prompted to configure your keyboard with the appropriate keymap.

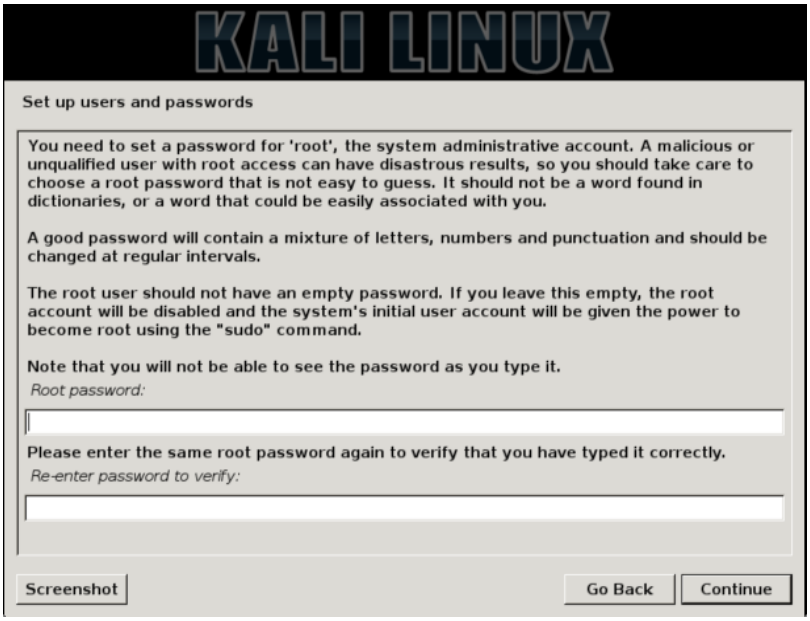


5. The installer will copy the image to your hard disk, probe your network interfaces, and then prompt you to enter a hostname and domain name for your system. In the example below, we've entered 'kali' as our hostname.

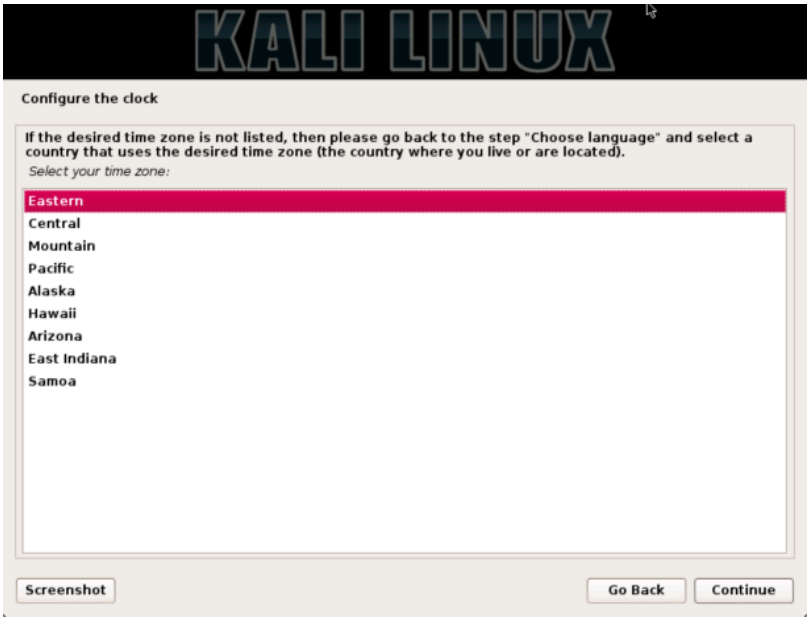
- If the setup detects multiple NICs, it may prompt you which one to use for the install.
- If the chosen NIC is 802.11 based, you will be asked for your wireless network information before being prompted for a hostname.
- If there isn't a DHCP service running on the network, it will ask you to manually enter the network information after probing for network interfaces.
- If Kali Linux doesn't detect your NIC, you either need to include the drivers for it when prompted, or generate a custom Kali Linux ISO with them pre-included.


KALI LINUX
Configure the network
Please enter the hostname for this system.
The hostname is a single word that identifies your system to the network. If you don't know what your hostname should be, consult your network administrator. If you are setting up your own home network, you can make something up here.
Hostname:
kali
Screenshot
Go Back
Continue

6. Enter a robust password for the root account.


KALI LINUX
Set up users and passwords
You need to set a password for 'root', the system administrative account. A malicious or unqualified user with root access can have disastrous results, so you should take care to choose a root password that is not easy to guess. It should not be a word found in dictionaries, or a word that could be easily associated with you.
A good password will contain a mixture of letters, numbers and punctuation and should be changed at regular intervals.
The root user should not have an empty password. If you leave this empty, the root account will be disabled and the system's initial user account will be given the power to become root using the "sudo" command.
Note that you will not be able to see the password as you type it.
Root password:
Please enter the same root password again to verify that you have typed it correctly.
Re-enter password to verify:
Screenshot
Go Back
Continue

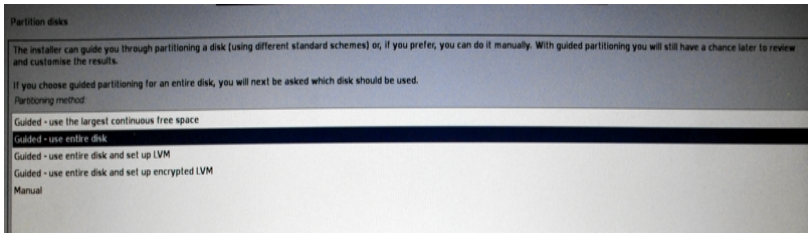
7. Next, set your time zone.



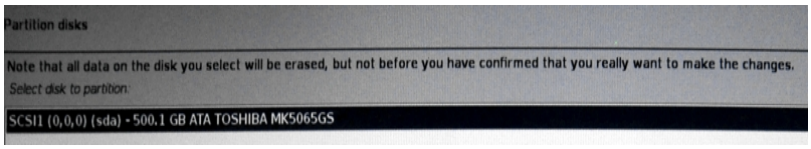
8. The installer will now probe your disks and offer you five choices. In our example, we're using the entire disk on our computer and not configuring LVM (logical volume manager), so we selected 'Guided – use the entire disk'.

- Experienced users can use the 'Manual' option for more granular configuration options. This option will also allow you to set up encrypted LVM, so Kali Linux would be fully encrypted. The screen afterwards will prompt you for the password. You will have to enter the same password every time you start up Kali Linux.

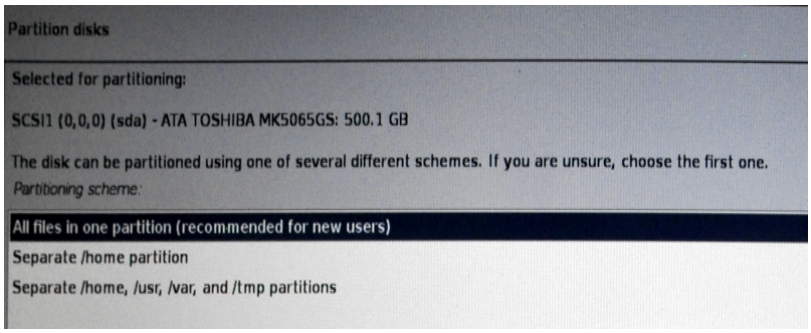
Kali will automatically securely wipe the hard disk before asking for the LVM password. This may take ‘a while’ (hours) depending on the size and speed of the drive. If you wish to risk it, you can skip it.


Partition disks
The installer can guide you through partitioning a disk (using different standard schemes) or, if you prefer, you can do it manually. With guided partitioning you will still have a chance later to review and customise the results.
If you choose guided partitioning for an entire disk, you will next be asked which disk should be used.
Partitioning method:
Guided - use the largest continuous free space
Guided - use entire disk
Guided - use entire disk and set up LVM
Guided - use entire disk and set up encrypted LVM
Manual

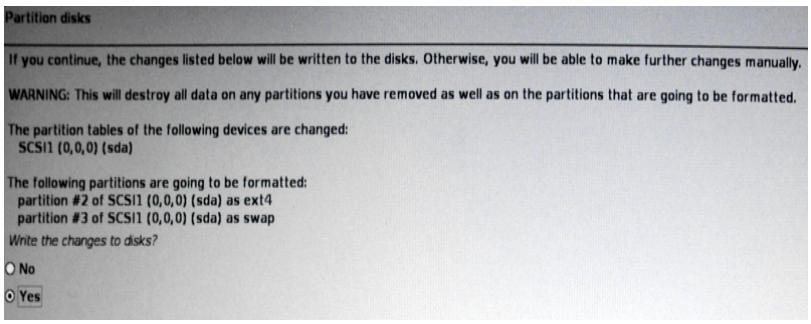
9. The installer will ask you to confirm which disk to erase. Double check then confirm the selection.


Partition disks
Note that all data on the disk you select will be erased, but not before you have confirmed that you really want to make the changes.
Select disk to partition:
SCSI1 (0,0,0) (sda) - 500.1 GB ATA TOSHIBA MK5065GS

10. The next stage is to select the partition structure you want to use. We will go ahead and use the default option and have everything on one partition. Afterwards, the installer will display an overview. If you agree with what it suggests, press the continue button.

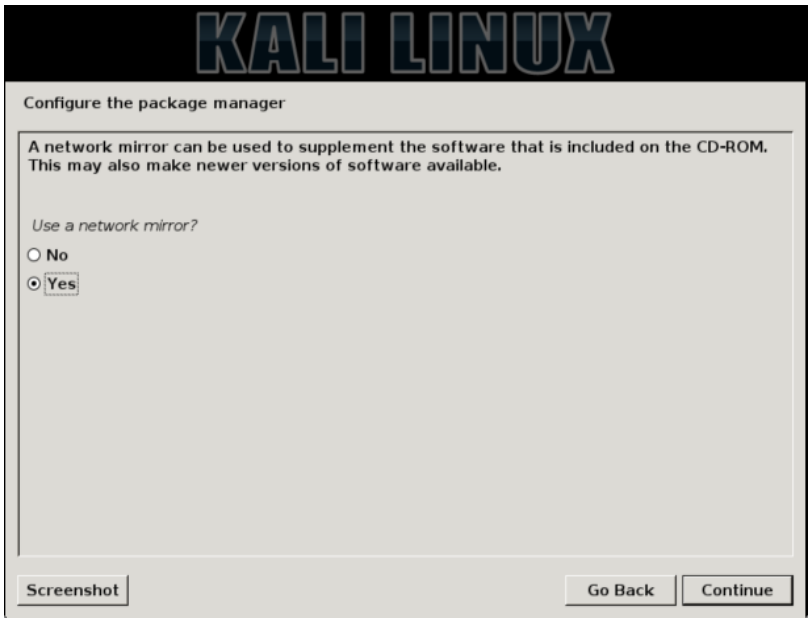

Partition disks
Selected for partitioning:
SCSI1 (0,0,0) (sda) - ATA TOSHIBA MK5065GS: 500.1 GB
The disk can be partitioned using one of several different schemes. If you are unsure, choose the first one.
Partitioning scheme:
All files in one partition (recommended for new users)
Separate /home partition
Separate /home, /usr, /var, and /tmp partitions

11. Next, you’ll have one last chance to review your disk configuration before the installer makes irreversible changes. After you click **Continue**, the installer will go to work and you’ll have an almost finished installation.

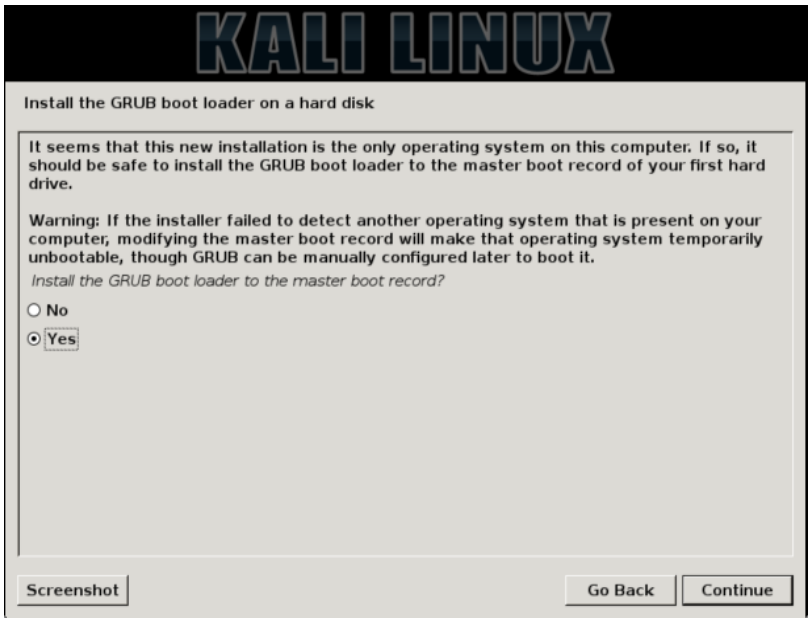

Partition disks
If you continue, the changes listed below will be written to the disks. Otherwise, you will be able to make further changes manually.
WARNING: This will destroy all data on any partitions you have removed as well as on the partitions that are going to be formatted.
The partition tables of the following devices are changed:
SCSI1 (0,0,0) (sda)
The following partitions are going to be formatted:
partition #2 of SCSI1 (0,0,0) (sda) as ext4
partition #3 of SCSI1 (0,0,0) (sda) as swap
Write the changes to disks?
No
Yes

12.This screen configures the use of our Internet network mirrors. Kali can use our online central repository to distribute applications to keep packages up-to-date and allow for additional programs to be installed more easily. Should you need to enter any appropriate proxy information, the next screen will allow you to enter details.

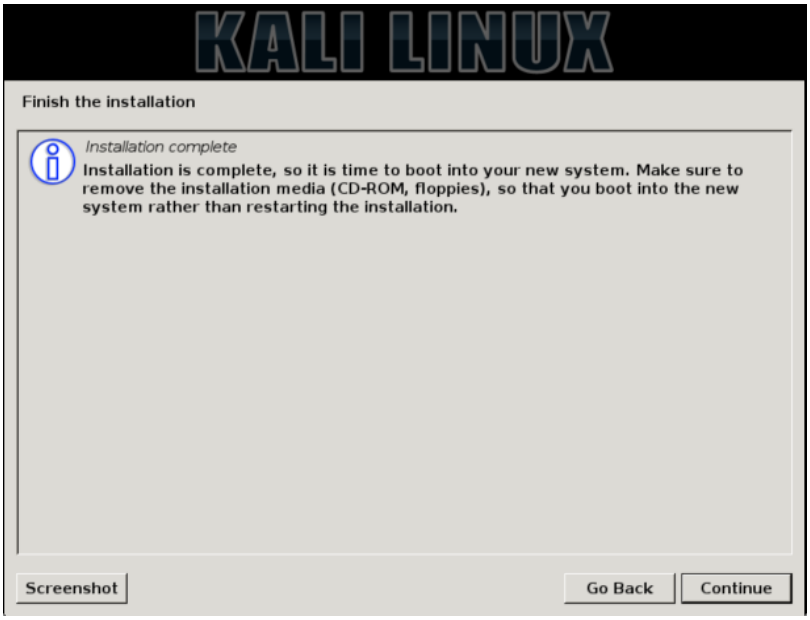
If you select ‘NO’ in this screen, you will NOT be able to install packages from Kali repositories until you alter your sources.


KALI LINUX
Configure the package manager
A network mirror can be used to supplement the software that is included on the CD-ROM. This may also make newer versions of software available.
Use a network mirror?
No
Yes
Screenshot
Go Back
Continue

13.Next, install the GRUB bootloader.


KALI LINUX
Install the GRUB boot loader on a hard disk
It seems that this new installation is the only operating system on this computer. If so, it should be safe to install the GRUB boot loader to the master boot record of your first hard drive.
Warning: If the installer failed to detect another operating system that is present on your computer, modifying the master boot record will make that operating system temporarily unbootable, though GRUB can be manually configured later to boot it.
Install the GRUB boot loader to the master boot record?
No
Yes
Screenshot
Go Back
Continue

14.Finally, click **Continue** to finish installing Kali Linux. It is highly recommend that you restart your machine at this stage.
Once the install has finished, repeat the first few steps again to boot into ‘Live mode’ once more.


KALI LINUX
Finish the installation
Installation complete
Installation is complete, so it is time to boot into your new system. Make sure to remove the installation media (CD-ROM, floppies), so that you boot into the new system rather than restarting the installation.
Screenshot
Go Back
Continue

15.If the **gdisk** package isn’t included your Kali Linux ISO, you need to install it.
If you enabled the network repository during the setup, this can easily be done as follows:

```
apt-get update
apt-get install gdisk
```

16.We are now going to convert the MBR to a hybrid, which will allow for Apple’s EFI to detect and boot to GRUB.

```
root@kali:~# gdisk /dev/sda
zsh: correct 'gdisk' to 'fdisk' [nyae]? n
GPT fdisk (gdisk) version 0.8.5

Partition table scan:
  MBR: protective
  BSD: not present
  APM: not present
  GPT: present

Found valid GPT with protective MBR; using GPT.

Command (? for help): p
```

```
Disk /dev/sda: 976773168 sectors, 465.8 GiB
Logical sector size: 512 bytes
Disk identifier (GUID): B6A4398E-3590-4BB7-AA57-D64EF74860D0
Partition table holds up to 128 entries
First usable sector is 34, last usable sector is 976773134
Partitions will be aligned on 2048-sector boundaries
Total free space is 4077 sectors (2.0 MiB)

Number  Start (sector)    End (sector)  Size       Code  Name
   1            2048            4095   1024.0 KiB  EF02
   2            4096       943585279   449.9 GiB   0700
   3       943585280       976771071   15.8 GiB    8200

Command (? for help): r

Recovery/transformation command (? for help): h

WARNING! Hybrid MBRs are flaky and dangerous! If you decide not to use one,
just hit the Enter key at the below prompt and your MBR partition table will
be untouched.

Type from one to three GPT partition numbers, separated by spaces, to be
added to the hybrid MBR, in sequence: 2
Place EFI GPT (0xEE) partition first in MBR (good for GRUB)? (Y/N): y

Creating entry for GPT partition #2 (MBR partition #2)
Enter an MBR hex code (default 07): 83
Set the bootable flag? (Y/N): y

Unused partition space(s) found. Use one to protect more partitions? (Y/N): n

Recovery/transformation command (? for help): w

Final checks complete. About to write GPT data. THIS WILL OVERWRITE EXISTING
PARTITIONS!!

Do you want to proceed? (Y/N): y
OK; writing new GUID partition table (GPT) to /dev/sda.
Warning: The kernel is still using the old partition table.
```

The new table will be used at the next reboot.
The operation has completed successfully.
root@kali:~#

17.After that is complete, all that is left is to reboot, take out the installation media, and enjoy Kali.

SEARCH

Single Boot Kali on Mac Hardware

/03. Installing Kali Linux /Single Boot Kali on Mac Hardware

Kali Linux Installation Requirements

Since the release of Kali Linux 1.0.8, Kali Linux supports EFI out of the box. This added feature simplifies the process of getting Kali installed and running on various Apple MacBook Air, Pro, and Retina models.

The make/model/year of the device will determine how successful your experience will be, with newer devices having a better chance of working. Pre-installing rEFInd may also increase the odds of success on older devices.

This guide will show you to **replace** OSX with Kali Linux, with the option of encrypting the partition. However, if you wish to keep OSX, you will want to refer to our dual-boot guide instead.

Installation Prerequisites

- A minimum of 20 GB disk space for the Kali Linux install.
- A minimum of 1 GB RAM. 2 GB or more recommended.
- For devices **older** than **late 2012**, you will need a blank DVD.
    - **USB booting may not work without rEFInd** installed.
- For devices **newer** than **late 2012**, you'll need a blank DVD **or** a USB drive.
    - OSX 10.7 or higher.

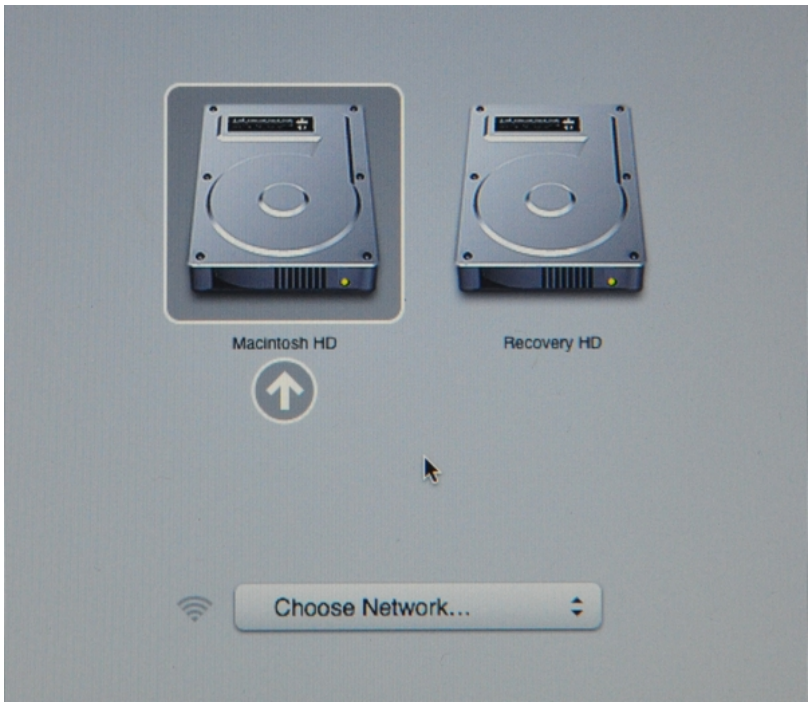
Preparing for the Installation

1. Download Kali linux.

2. Burn the Kali Linux ISO image to a DVD or copy the image to USB drive.
3. Backup any important information on the device to an external media.

Kali Linux Installation Procedure

1. To start your installation, power on the device and immediately press and hold the **Option** key until you see the boot menu.



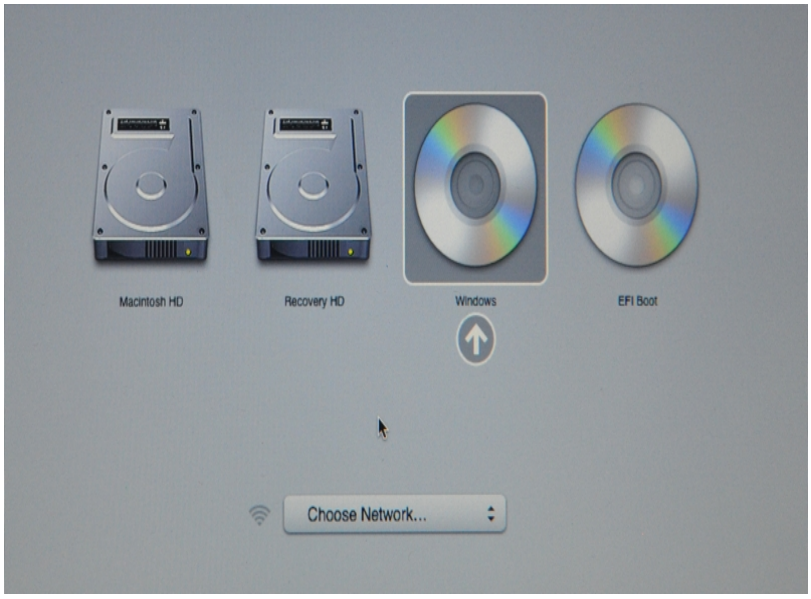
2. Now insert your chosen installation media. If everything was successful, you will see **two** volumes (EFI & Windows). Even though Kali Linux is based on Debian, Apple detects it as Windows.

   Select the **Windows** volume to continue.

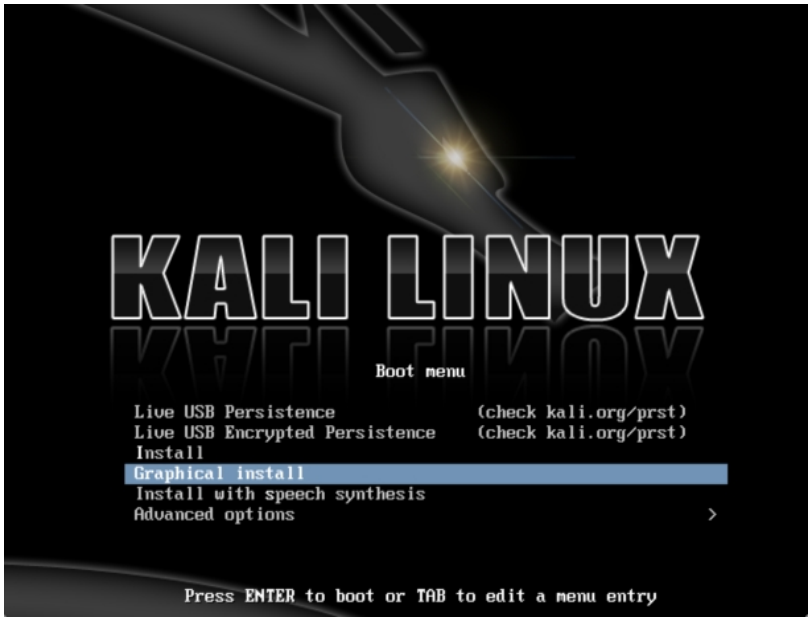
   - If you only see **one volume** (EFI), then the installation media **is not supported**for this device.

     You may wish to install **rEFInd** and try again.

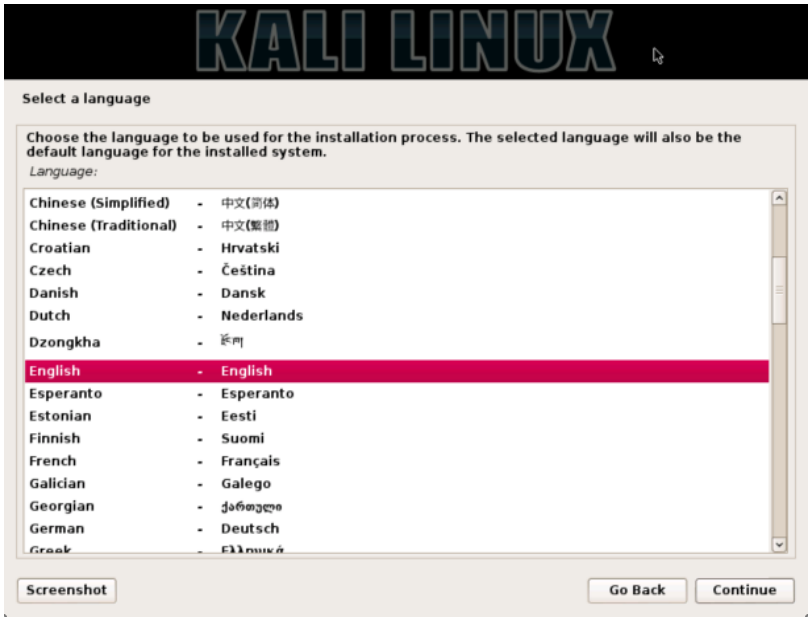
   - If you select the EFI volume, the booting will hang at this point and you will **not** be able to continue.



3. You should be greeted with the Kali boot screen. You are free to choose ‘Live’, ‘Graphical Install’, or ‘(Text-Mode) Install’ to install. In this example, we picked ‘Graphical install’.



4. Select your preferred language and then your country location. You’ll also be prompted to configure your keyboard with the appropriate keymap.



5. The installer will copy the image to your hard disk, probe your network interfaces, and then prompt you to enter a hostname and domain name for your system. In the example below, we've entered 'kali' as our hostname.

- If the setup detects multiple NICs, it may prompt you which one to use for the install.
- If the chosen NIC is 802.11 based, you will be asked for your wireless network information before being prompted for a hostname.
- If there isn't a DHCP service running on the network, it will ask you to manually enter the network information after probing for network interfaces.
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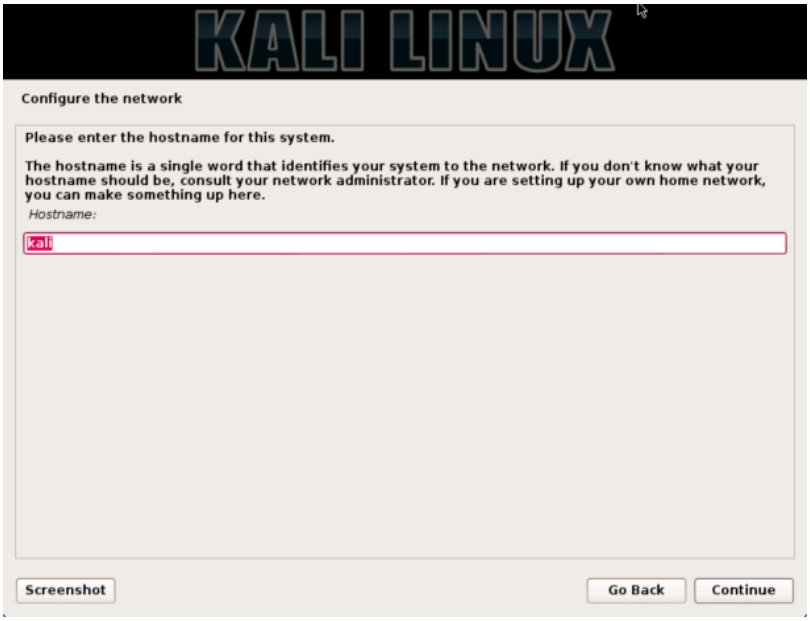
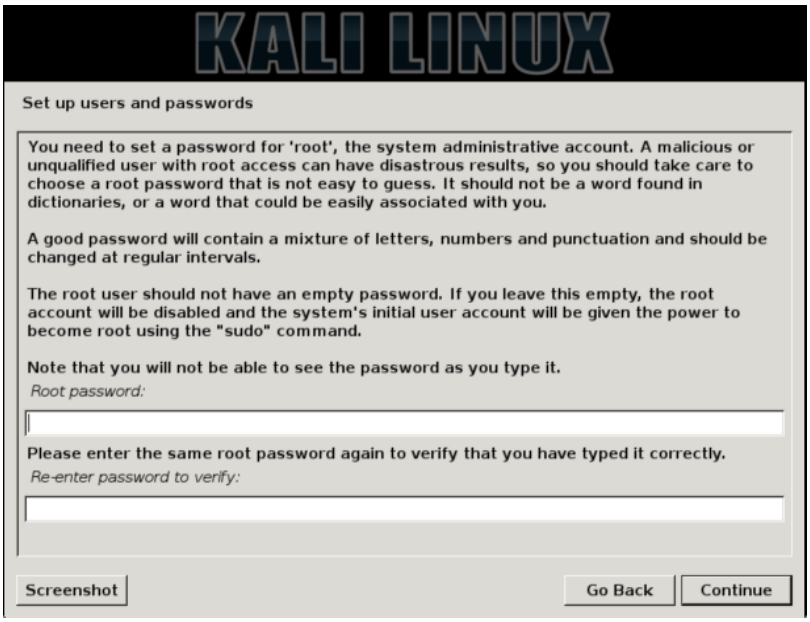

KALI LINUX
Configure the network
Please enter the hostname for this system.
The hostname is a single word that identifies your system to the network. If you don't know what your hostname should be, consult your network administrator. If you are setting up your own home network, you can make something up here.
Hostname:
kali
Screenshot
Go Back
Continue

6. Enter a robust password for the root account.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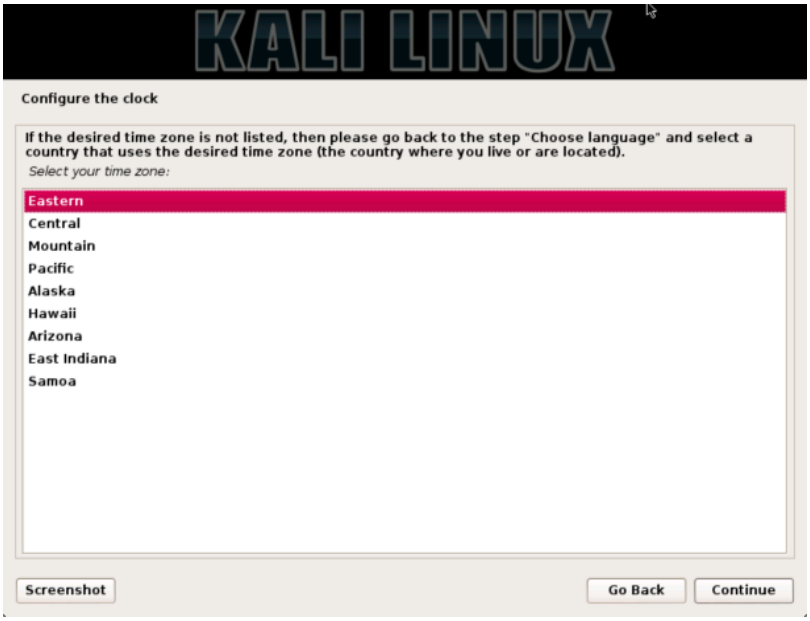
Note that you will not be able to see the password as you type it.
Root password:
Please enter the same root password again to verify that you have typed it correctly.
Re-enter password to verify:
Screenshot
Go Back
Continue

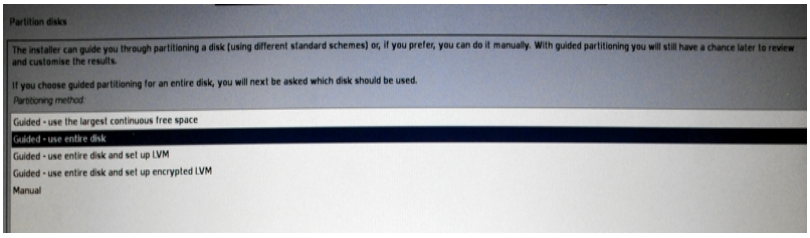
7. Next, set your time zone.



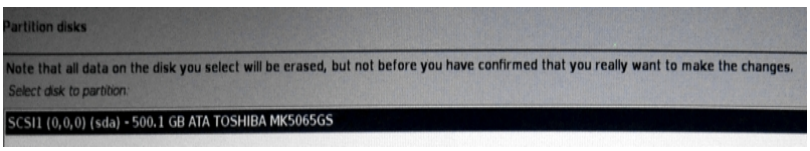
8. The installer will now probe your disks and offer you five choices. In our example, we're using the entire disk on our computer and not configuring LVM (logical volume manager), so we selected 'Guided – use the entire disk'.

- Experienced users can use the 'Manual' option for more granular configuration options. This option will also allow you to set up encrypted LVM, so Kali Linux would be fully encrypted. The screen afterwards will prompt you for the password. You will have to enter the same password every time you start up Kali Linux.

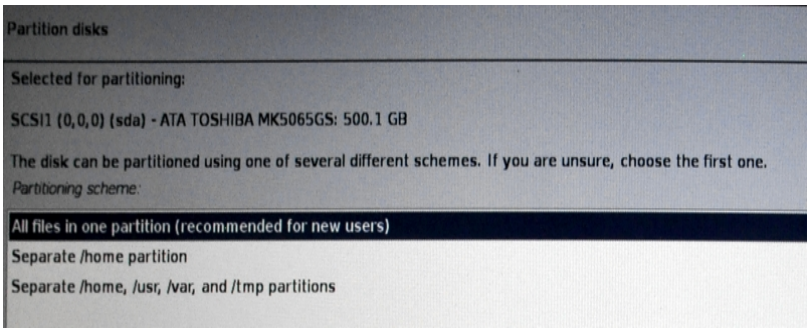
Kali will automatically securely wipe the hard disk before asking for the LVM password. This may take 'a while' (hours) depending on the size and speed of the drive. If you wish to risk it, you can skip it.


Partition disks
The installer can guide you through partitioning a disk (using different standard schemes) or, if you prefer, you can do it manually. With guided partitioning you will still have a chance later to review and customise the results.
If you choose guided partitioning for an entire disk, you will next be asked which disk should be used.
Partitioning method:
Guided - use the largest continuous free space
Guided - use entire disk
Guided - use entire disk and set up LVM
Guided - use entire disk and set up encrypted LVM
Manual

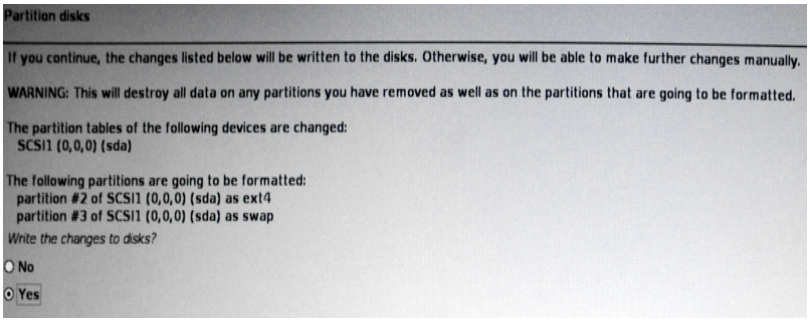
9. The installer will ask you to confirm which disk to erase. Double check then confirm the selection.


Partition disks
Note that all data on the disk you select will be erased, but not before you have confirmed that you really want to make the changes.
Select disk to partition:
SCSI1 (0,0,0) (sda) - 500.1 GB ATA TOSHIBA MK5065GS

10. The next stage is to select the partition structure you want to use. We will go ahead and use the default option and have everything on one partition. Afterwards, the installer will display an overview. If you agree with what it suggests, press the continue button.

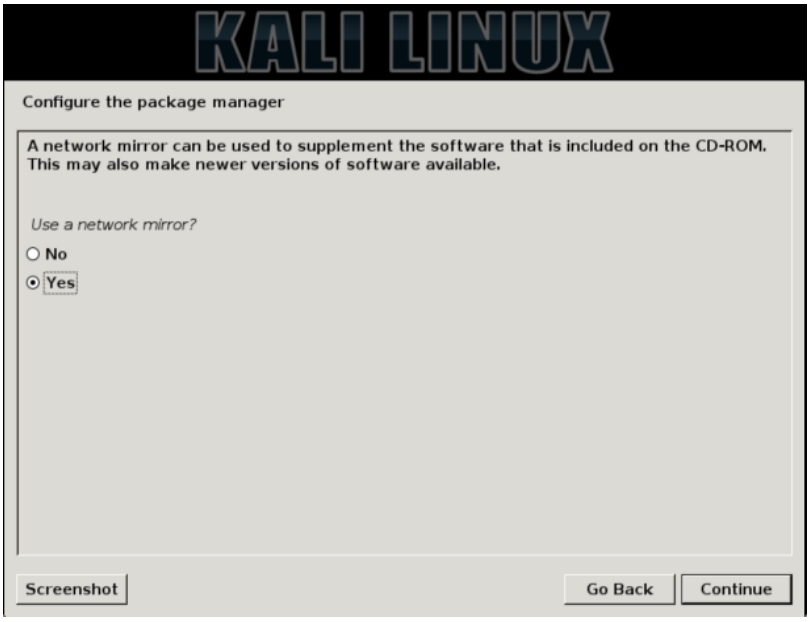

Partition disks
Selected for partitioning:
SCSI1 (0,0,0) (sda) - ATA TOSHIBA MK5065GS: 500.1 GB
The disk can be partitioned using one of several different schemes. If you are unsure, choose the first one.
Partitioning scheme:
All files in one partition (recommended for new users)
Separate /home partition
Separate /home, /usr, /var, and /tmp partitions

11. Next, you'll have one last chance to review your disk configuration before the installer makes irreversible changes. After you click **Continue**, the installer will go to work and you'll have an almost finished installation.

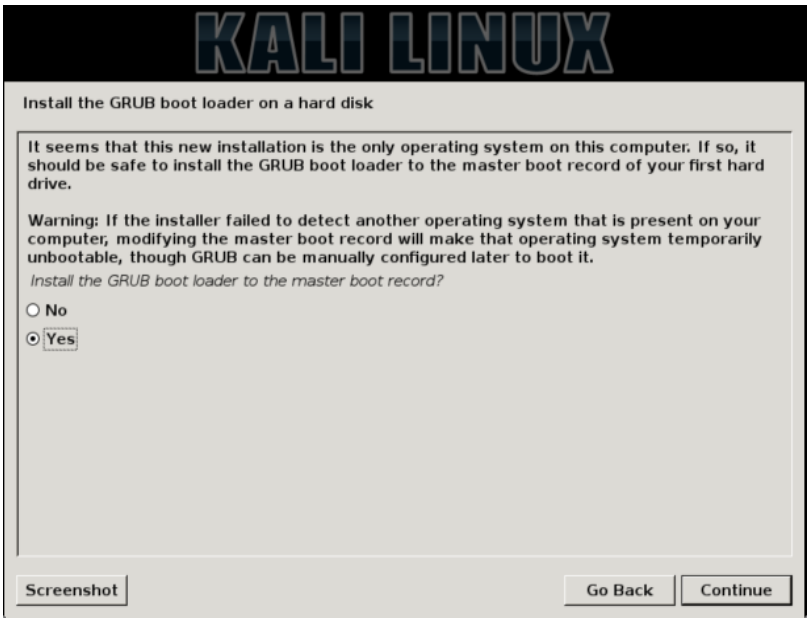

Partition disks
If you continue, the changes listed below will be written to the disks. Otherwise, you will be able to make further changes manually.
WARNING: This will destroy all data on any partitions you have removed as well as on the partitions that are going to be formatted.
The partition tables of the following devices are changed:
SCSI1 (0,0,0) (sda)
The following partitions are going to be formatted:
partition #2 of SCSI1 (0,0,0) (sda) as ext4
partition #3 of SCSI1 (0,0,0) (sda) as swap
Write the changes to disks?
No
Yes

12. This screen configures the use of our Internet network mirrors. Kali can use our online central repository to distribute applications to keep packages up-to-date and allow for additional programs to be installed more easily. Should you need to enter any appropriate proxy information, the next screen will allow you to enter details.

If you select 'NO' in this screen, you will NOT be able to install packages from Kali repositories until you alter your sources.

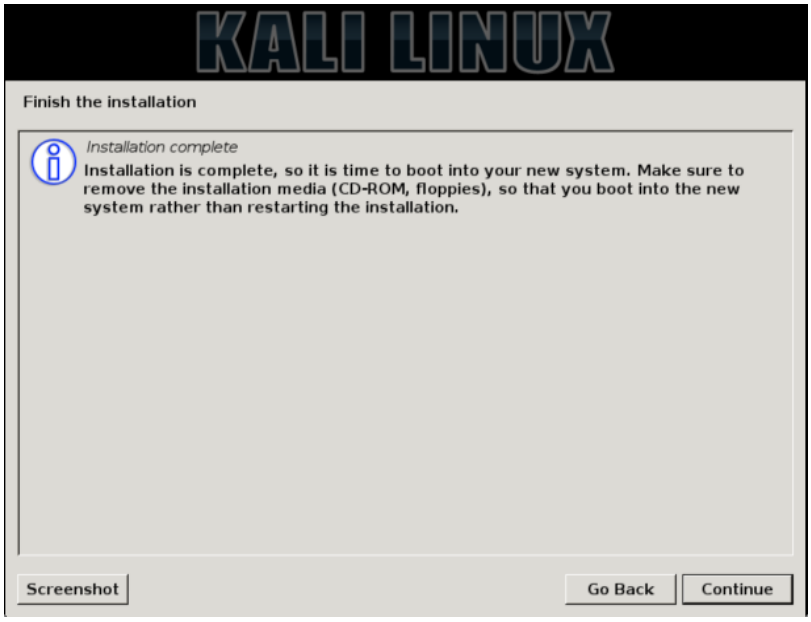

KALI LINUX
Configure the package manager
A network mirror can be used to supplement the software that is included on the CD-ROM. This may also make newer versions of software available.
Use a network mirror?
No
Yes
Screenshot
Go Back
Continue

13.Next, install the GRUB bootloader.


KALI LINUX
Install the GRUB boot loader on a hard disk
It seems that this new installation is the only operating system on this computer. If so, it should be safe to install the GRUB boot loader to the master boot record of your first hard drive.
Warning: If the installer failed to detect another operating system that is present on your computer, modifying the master boot record will make that operating system temporarily unbootable, though GRUB can be manually configured later to boot it.
Install the GRUB boot loader to the master boot record?
No
Yes
Screenshot
Go Back
Continue

14.Finally, click **Continue** to finish installing Kali Linux. It is highly recommend that you restart your machine at this stage.

Once the install has finished, repeat the first few steps again to boot into ‘Live mode’ once more.


KALI LINUX
Finish the installation
Installation complete
Installation is complete, so it is time to boot into your new system. Make sure to remove the installation media (CD-ROM, floppies), so that you boot into the new system rather than restarting the installation.
Screenshot
Go Back
Continue

15.If the **gdisk** package isn't included your Kali Linux ISO, you need to install it. If you enabled the network repository during the setup, this can easily be done as follows:

```
apt-get update
apt-get install gdisk
```

16.We are now going to convert the MBR to a hybrid, which will allow for Apple's EFI to detect and boot to GRUB.

```
root@kali:~# gdisk /dev/sda
zsh: correct 'gdisk' to 'fdisk' [nyae]? n
GPT fdisk (gdisk) version 0.8.5

Partition table scan:
  MBR: protective
  BSD: not present
  APM: not present
  GPT: present

Found valid GPT with protective MBR; using GPT.


Command (? for help): p
Disk /dev/sda: 976773168 sectors, 465.8 GiB
Logical sector size: 512 bytes
Disk identifier (GUID): B6A4398E-3590-4BB7-AA57-D64EF74860D0
```

```
Partition table holds up to 128 entries
First usable sector is 34, last usable sector is 976773134
Partitions will be aligned on 2048-sector boundaries
Total free space is 4077 sectors (2.0 MiB)

Number  Start (sector)    End (sector)  Size       Code  Name
   1            2048            4095   1024.0 KiB  EF02
   2            4096       943585279   449.9 GiB   0700
   3       943585280       976771071   15.8 GiB    8200

Command (? for help): r

Recovery/transformation command (? for help): h

WARNING! Hybrid MBRs are flaky and dangerous! If you decide not to use one,
just hit the Enter key at the below prompt and your MBR partition table will
be untouched.

Type from one to three GPT partition numbers, separated by spaces, to be
added to the hybrid MBR, in sequence: 2
Place EFI GPT (0xEE) partition first in MBR (good for GRUB)? (Y/N): y

Creating entry for GPT partition #2 (MBR partition #2)
Enter an MBR hex code (default 07): 83
Set the bootable flag? (Y/N): y

Unused partition space(s) found. Use one to protect more partitions? (Y/N): n

Recovery/transformation command (? for help): w

Final checks complete. About to write GPT data. THIS WILL OVERWRITE
EXISTING
PARTITIONS!!

Do you want to proceed? (Y/N): y
OK; writing new GUID partition table (GPT) to /dev/sda.
Warning: The kernel is still using the old partition table.
The new table will be used at the next reboot.
```

The operation has completed successfully.
root@kali:~#

17.After that is complete, all that is left is to reboot, take out the installation media, and enjoy Kali.

Kali Linux Encrypted Disk Install

/03. Installing Kali Linux /Kali Linux Encrypted Disk Install

At times, we have sensitive data we would prefer to encrypt using full disk encryption. With the Kali Installer, you can initiate an LVM encrypted install on either Hard Disk or USB drives. The installation procedure is very similar to a “normal Kali Linux Install”, with the exception of choosing an Encrypted LVM partition during the installation process.

Kali Linux Encrypted Installation Requirements

Installing Kali Linux on your computer is an easy process. First, you’ll need compatible computer hardware. The hardware requirements are minimal as listed below, though better hardware will naturally provide better performance. The i386 images have a default PAEkernel, so you can run them on systems with over 4GB of RAM. Download Kali Linux and either burn the ISO to DVD, or prepare a USB stick with Kali Linux Live as the installation medium.

Installation Prerequisites

- A minimum of 20 GB disk space for the Kali Linux install.
- RAM for i386 and amd64 architectures, minimum: 1GB, recommended: 2GB or more.
- CD-DVD Drive / USB boot support

Preparing for the Installation

1. Download Kali linux.
2. Burn The Kali linux ISO to DVD or Image Kali Linux Live to USB.
3. Ensure that your computer is set to boot from CD / USB in your BIOS.

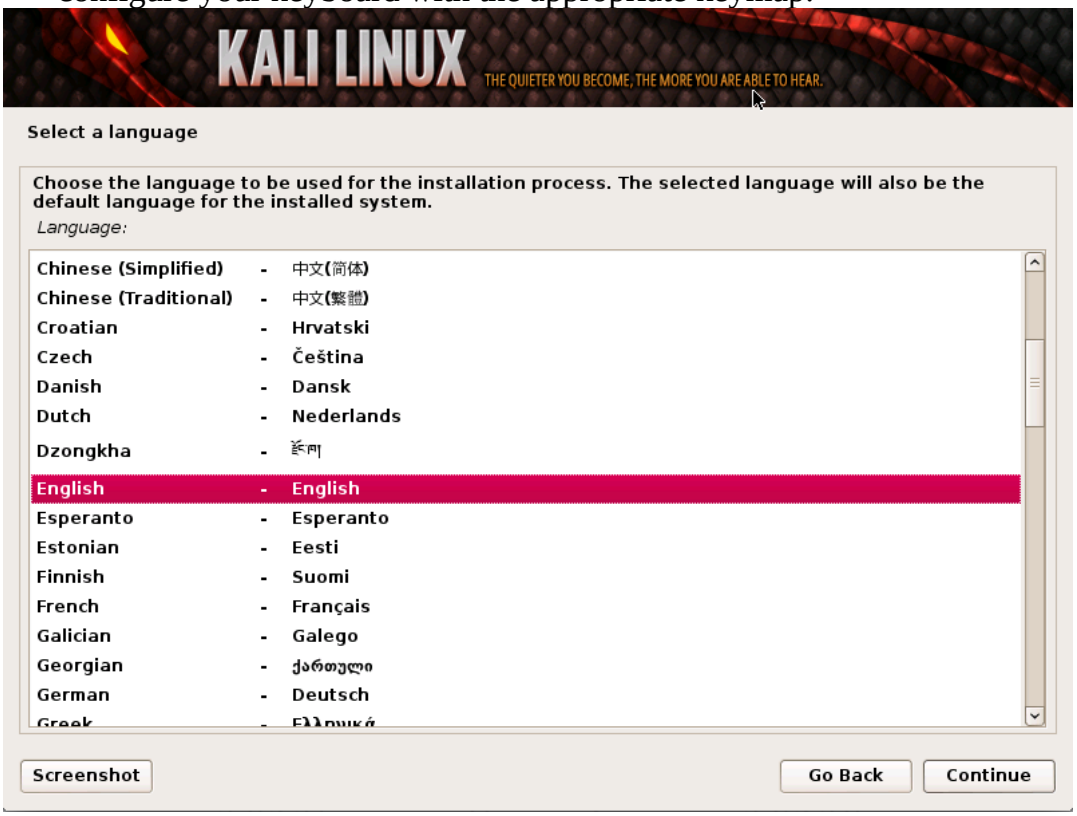
Kali Linux Installation Procedure

1. To start your installation, boot with your chosen installation medium. You should be greeted with the Kali Linux boot menu. Choose a *Graphical* or a *Text-Mode* install. In this example, we chose a GUI install.

KALI LIN
Boot menu
Live (amd64)
Live (amd64 failsafe)
Graphical install
Text-mode install

2. Select your preferred language and then your country location. You'll also be prompted to configure your keyboard with the appropriate keymap.

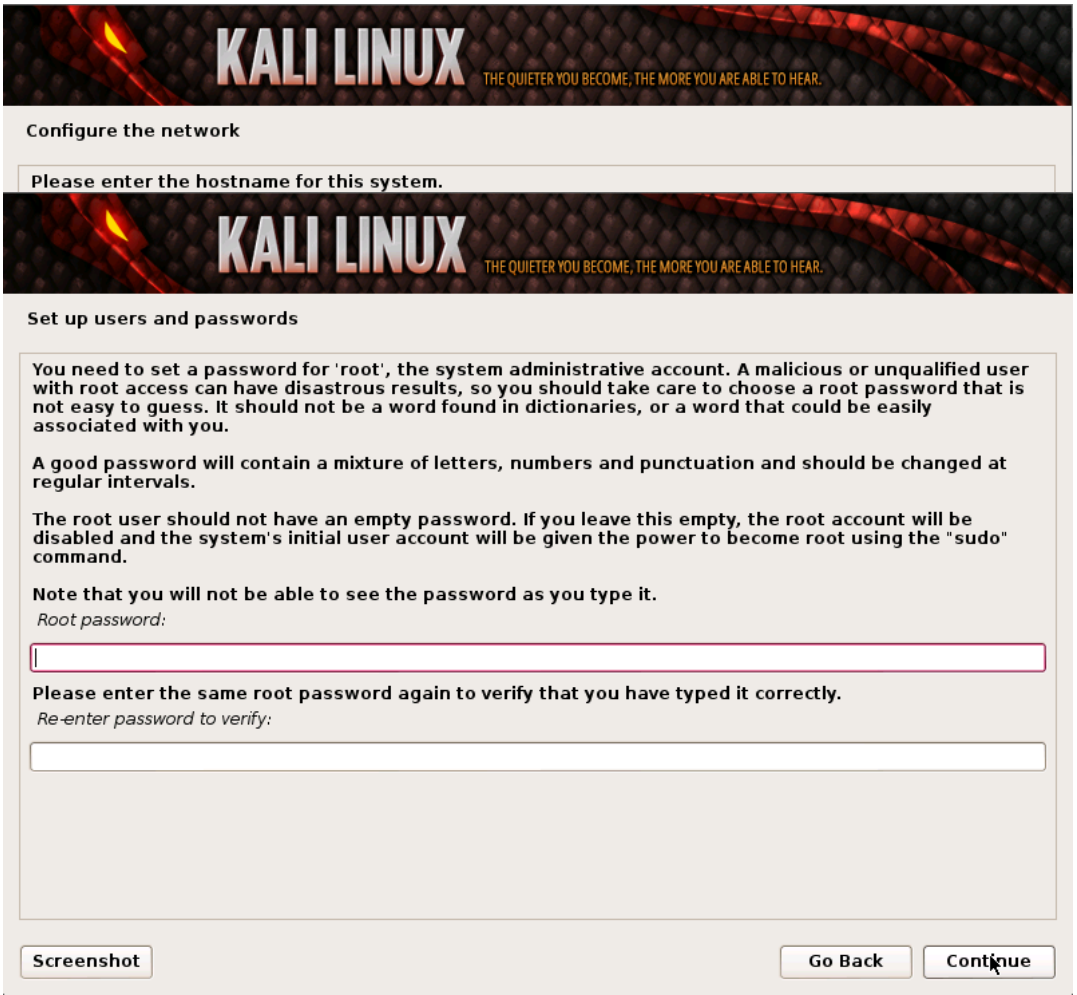
3. The installer will copy the image to your hard disk, probe your network interfaces, and then prompt you to enter a hostname for your system. In the example below,

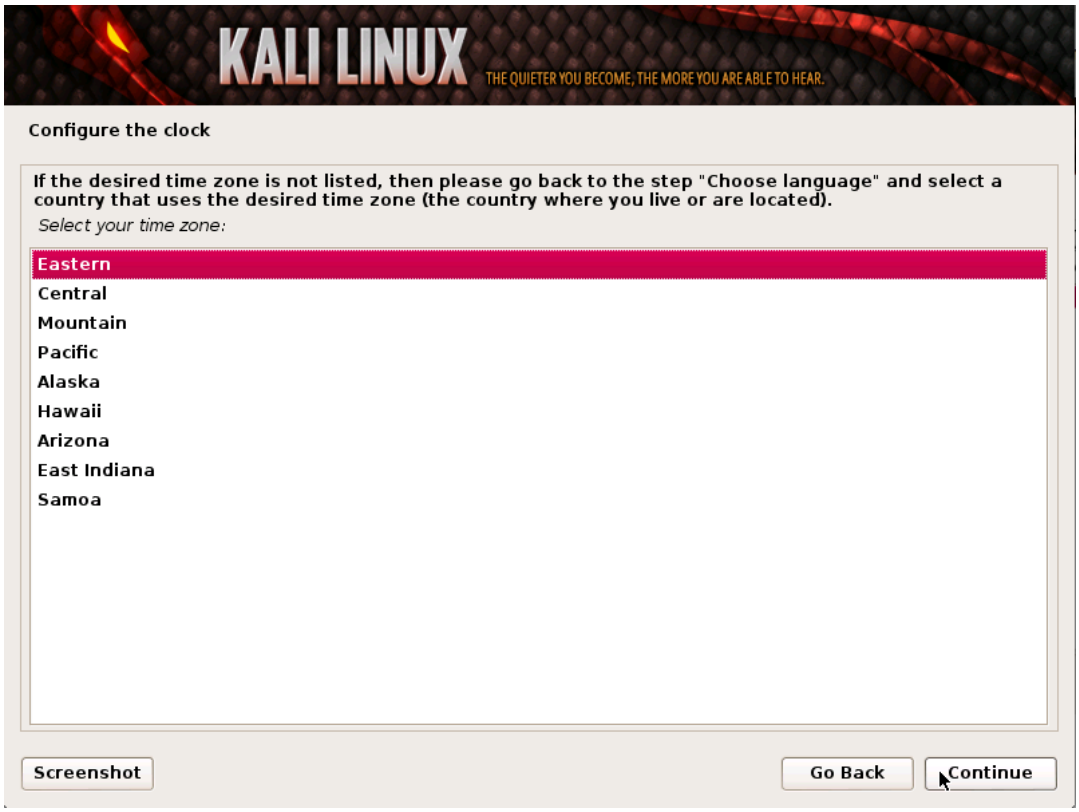


we've entered "kali" as the hostname.

4. Enter a robust password for the root account.

5. Next, set your time zone.


KALI LINUX
THE QUIETER YOU BECOME, THE MORE YOU ARE ABLE TO HEAR.
Configure the network
Please enter the hostname for this system.
KALI LINUX
THE QUIETER YOU BECOME, THE MORE YOU ARE ABLE TO HEAR.
Set up users and passwords
You need to set a password for 'root', the system administrative account. A malicious or unqualified user with root access can have disastrous results, so you should take care to choose a root password that is not easy to guess. It should not be a word found in dictionaries, or a word that could be easily associated with you.
A good password will contain a mixture of letters, numbers and punctuation and should be changed at regular intervals.
The root user should not have an empty password. If you leave this empty, the root account will be disabled and the system's initial user account will be given the power to become root using the "sudo" command.
Note that you will not be able to see the password as you type it.
Root password:
Please enter the same root password again to verify that you have typed it correctly.
Re-enter password to verify:
Screenshot
Go Back
Continue


KALI LINUX
THE QUIETER YOU BECOME, THE MORE YOU ARE ABLE TO HEAR.
Configure the clock
If the desired time zone is not listed, then please go back to the step "Choose language" and select a country that uses the desired time zone (the country where you live or are located).
Select your time zone:
Eastern
Central
Mountain
Pacific
Alaska
Hawaii
Arizona
East Indiana
Samoa
Screenshot
Go Back
Continue

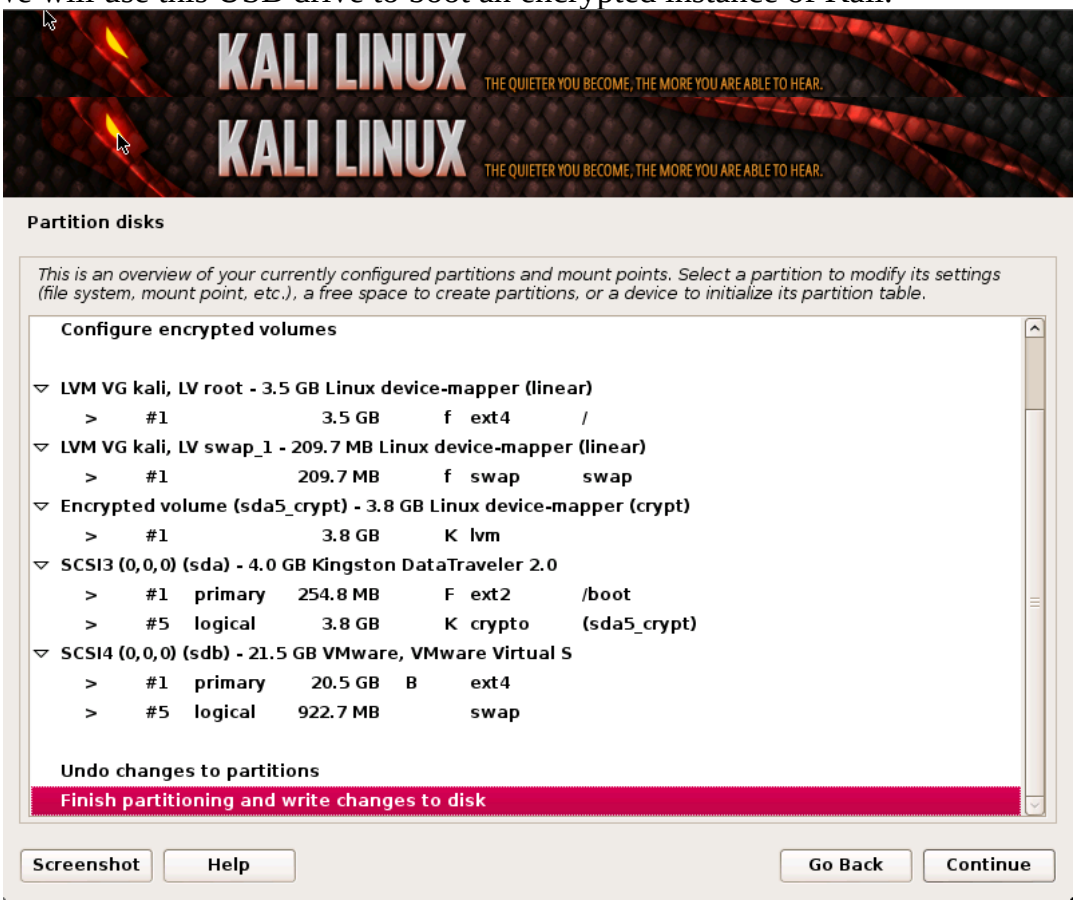
6. The installer will now probe your disks and offer you four choices. For an Encrypted LVM install, choose the "**Guided – use entire disk and set up encrypted LVM**" option as shown below.

KALI LINUX
THE QUIETER YOU BECOME, THE MORE YOU ARE ABLE TO HEAR.
Partition disks
The installer can guide you through partitioning a disk (using different standard schemes) or, if you prefer, you can do it manually. With guided partitioning you will still have a chance later to review and customise the results.
If you choose guided partitioning for an entire disk, you will next be asked which disk should be used.
Partitioning method:
Guided - use entire disk
Guided - use entire disk and set up LVM
Guided - use entire disk and set up encrypted LVM
Manual
Screenshot
Go Back
Continue

7. Choose the destination drive to install Kali. In this case, we chose a USB drive destination. We will use this USB drive to boot an encrypted instance of Kali.

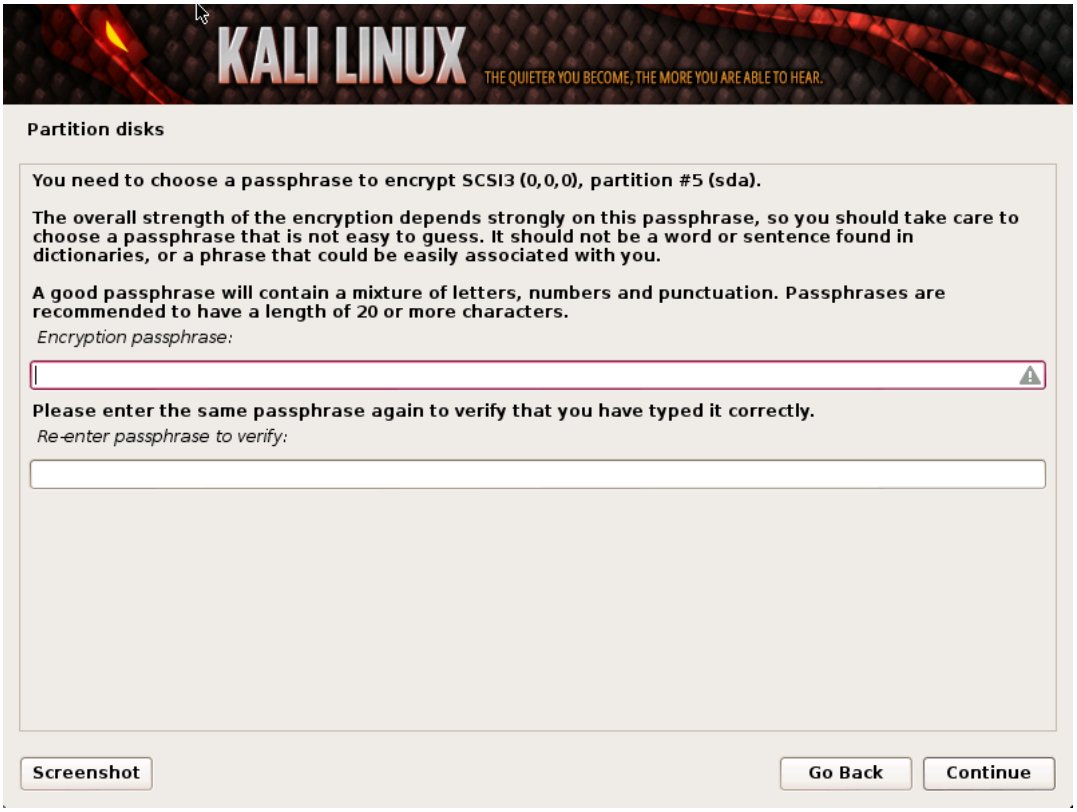
8. Confirm your partitioning scheme and continue the installation.

9. Next, you will be asked for an encryption password. You will


KALI LINUX
THE QUIETER YOU BECOME, THE MORE YOU ARE ABLE TO HEAR.
KALI LINUX
THE QUIETER YOU BECOME, THE MORE YOU ARE ABLE TO HEAR.
Partition disks
This is an overview of your currently configured partitions and mount points. Select a partition to modify its settings (file system, mount point, etc.), a free space to create partitions, or a device to initialize its partition table.
Configure encrypted volumes
LVM VG kali, LV root - 3.5 GB Linux device-mapper (linear)
> #1 3.5 GB f ext4 /
LVM VG kali, LV swap_1 - 209.7 MB Linux device-mapper (linear)
> #1 209.7 MB f swap swap
Encrypted volume (sda5_crypt) - 3.8 GB Linux device-mapper (crypt)
> #1 3.8 GB K lvm
SCSI3 (0,0,0) (sda) - 4.0 GB Kingston DataTraveler 2.0
> #1 primary 254.8 MB F ext2 /boot
> #5 logical 3.8 GB K crypto (sda5_crypt)
SCSI4 (0,0,0) (sdb) - 21.5 GB VMware, VMware Virtual S
> #1 primary 20.5 GB B ext4
> #5 logical 922.7 MB swap
Undo changes to partitions
Finish partitioning and write changes to disk
Screenshot
Help
Go Back
Continue

need to remember this password and use it each time to boot the encrypted instance of Kali Linux.

10. Configure network mirrors. Kali uses a central repository to distribute

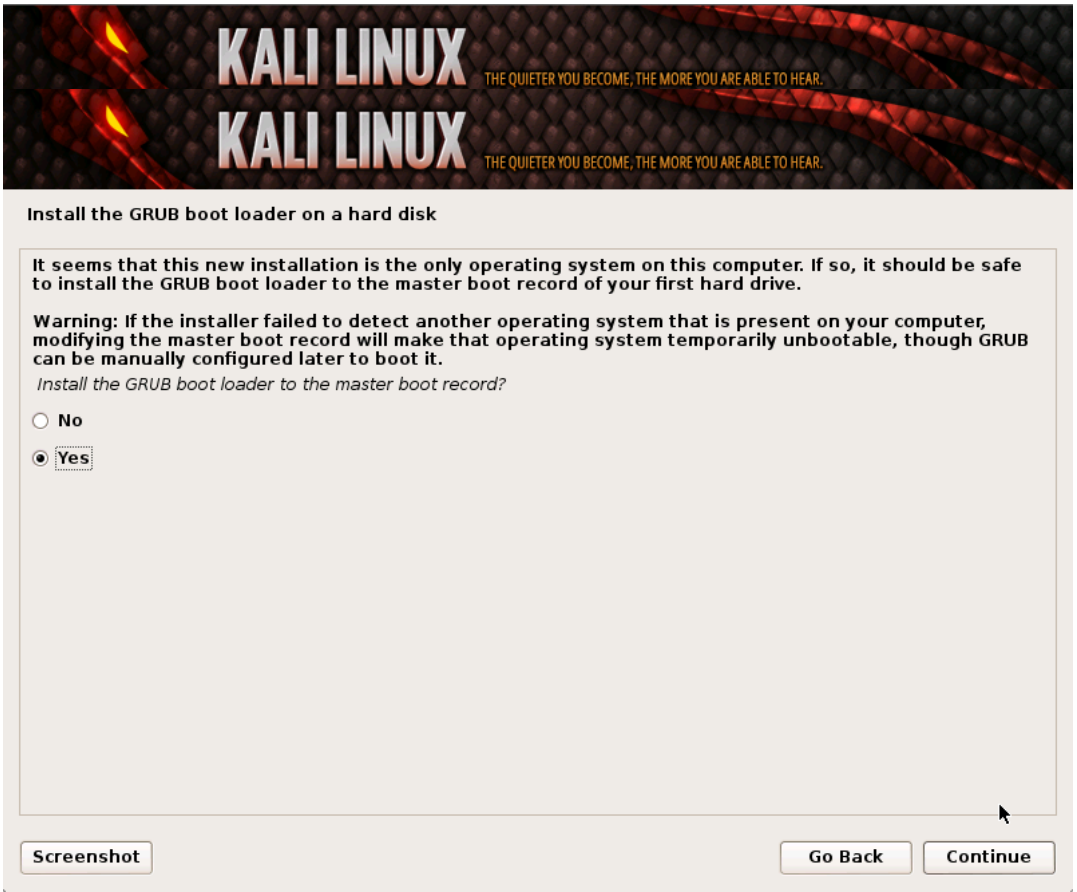

KALI LINUX
THE QUIETER YOU BECOME, THE MORE YOU ARE ABLE TO HEAR.
Partition disks
You need to choose a passphrase to encrypt SCSI3 (0,0,0), partition #5 (sda).
The overall strength of the encryption depends strongly on this passphrase, so you should take care to choose a passphrase that is not easy to guess. It should not be a word or sentence found in dictionaries, or a phrase that could be easily associated with you.
A good passphrase will contain a mixture of letters, numbers and punctuation. Passphrases are recommended to have a length of 20 or more characters.
Encryption passphrase:
Please enter the same passphrase again to verify that you have typed it correctly.
Re-enter passphrase to verify:
Screenshot
Go Back
Continue

applications. You'll need to enter any appropriate proxy information as needed.

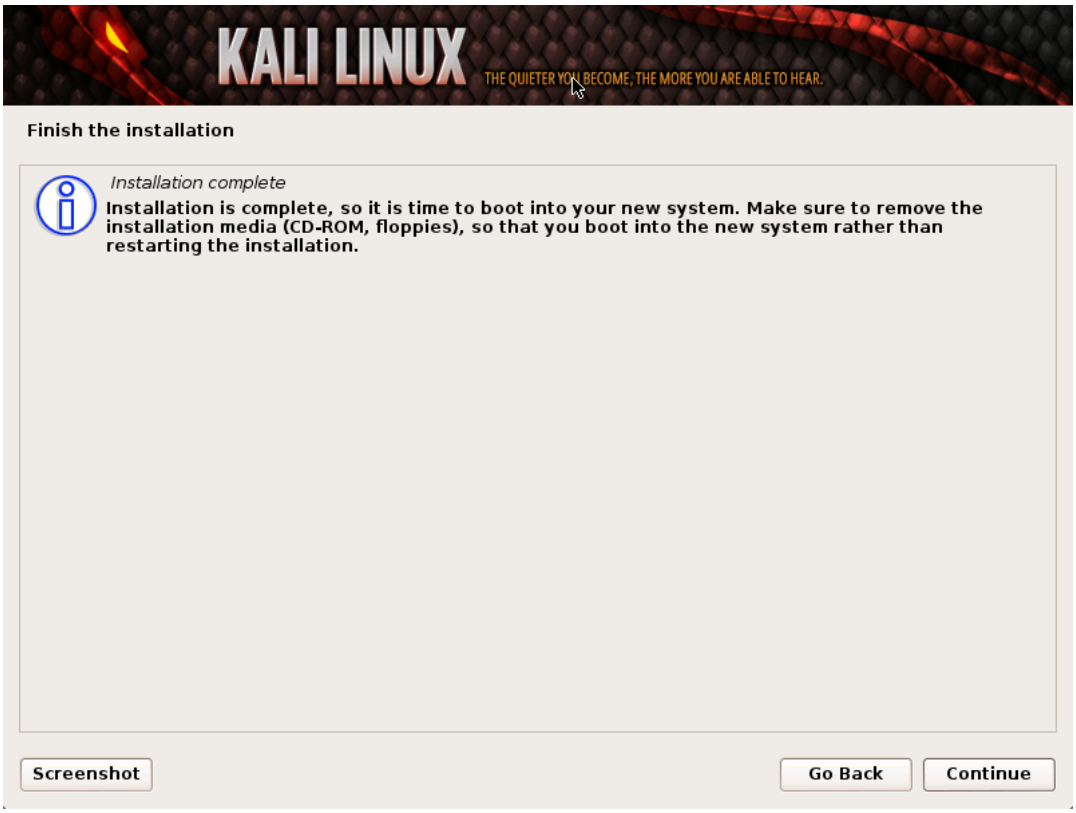
NOTE! If you select "NO" in this screen, you will **NOT** be able to install packages from the Kali repositories.

11. Next, install GRUB.

12. Finally, click *Continue* to reboot into your new Kali installation. If you used a USB device as a destination drive, make


KALI LINUX
THE QUIETER YOU BECOME, THE MORE YOU ARE ABLE TO HEAR.
KALI LINUX
THE QUIETER YOU BECOME, THE MORE YOU ARE ABLE TO HEAR.
Install the GRUB boot loader on a hard disk
It seems that this new installation is the only operating system on this computer. If so, it should be safe to install the GRUB boot loader to the master boot record of your first hard drive.
Warning: If the installer failed to detect another operating system that is present on your computer, modifying the master boot record will make that operating system temporarily unbootable, though GRUB can be manually configured later to boot it.
Install the GRUB boot loader to the master boot record?
No
Yes
Screenshot
Go Back
Continue

sure you enable booting from USB devices in your BIOS. You will be asked for the encryption password you set earlier on every boot.


KALI LINUX
THE QUIETER YOU BECOME, THE MORE YOU ARE ABLE TO HEAR.
Finish the installation
Installation complete
Installation is complete, so it is time to boot into your new system. Make sure to remove the installation media (CD-ROM, floppies), so that you boot into the new system rather than restarting the installation.
Screenshot
Go Back
Continue

Post Installation

Now that you've completed installing Kali Linux, it's time to customize your system. The Kali General Use section of our site has more information and you can also find tips on how to get the most out of Kali in our User Forums.

Kali Linux Mini ISO Install

/03. Installing Kali Linux /Kali Linux Mini ISO Install

Kali Mini ISO Install

The Kali mini ISO is a convenient way to install a minimal Kali system and install it "from scratch". The mini install ISO will download all required packages from our repositories, meaning you need to have a fast Internet connection to use this installation method.

Installation Prerequisites

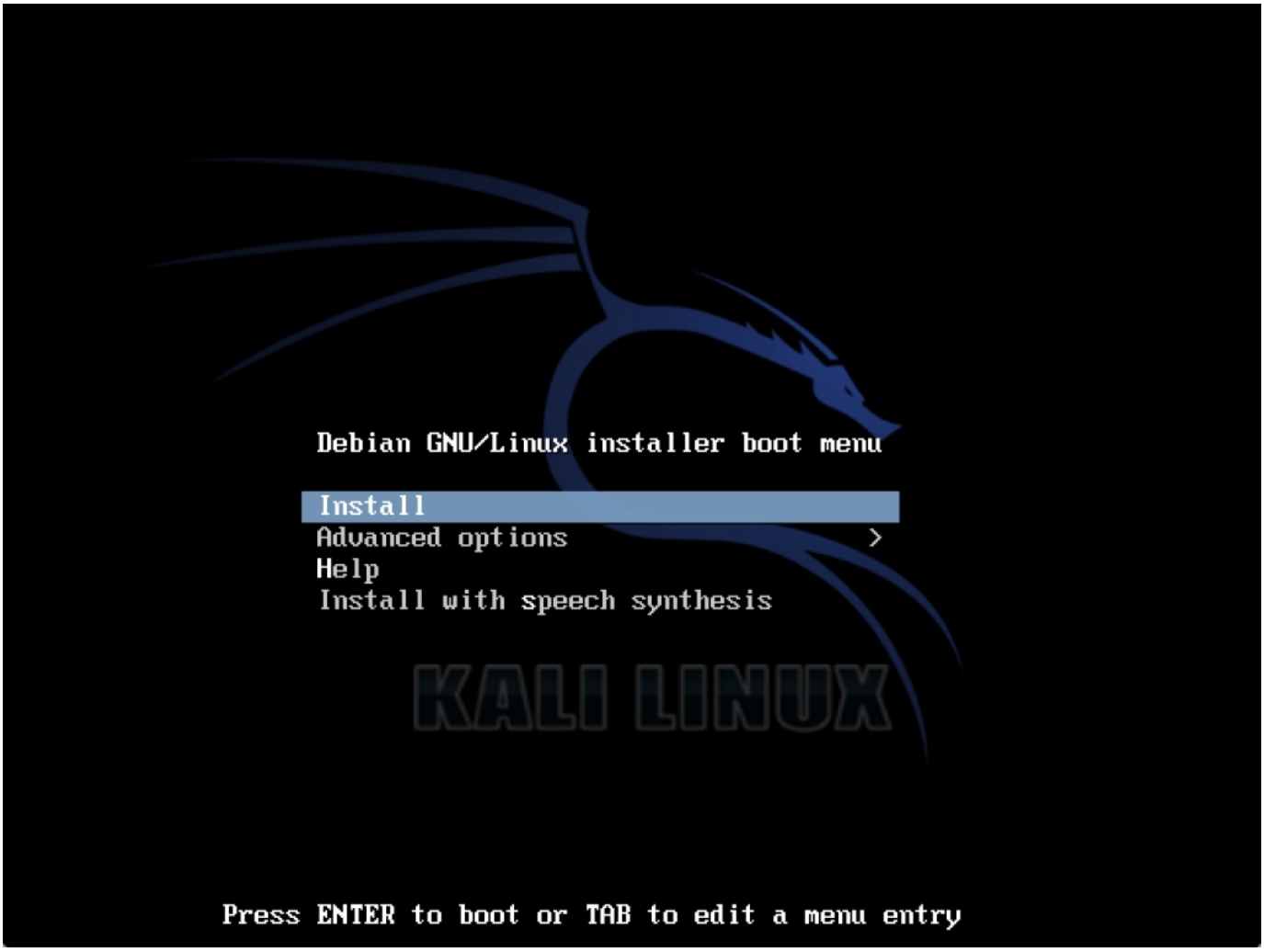
- A minimum of 8 GB disk space for the Kali Linux install.
- For i386 and amd64 architectures, a minimum of 512MB RAM.
- CD-DVD Drive / USB boot support

Preparing for the Installation

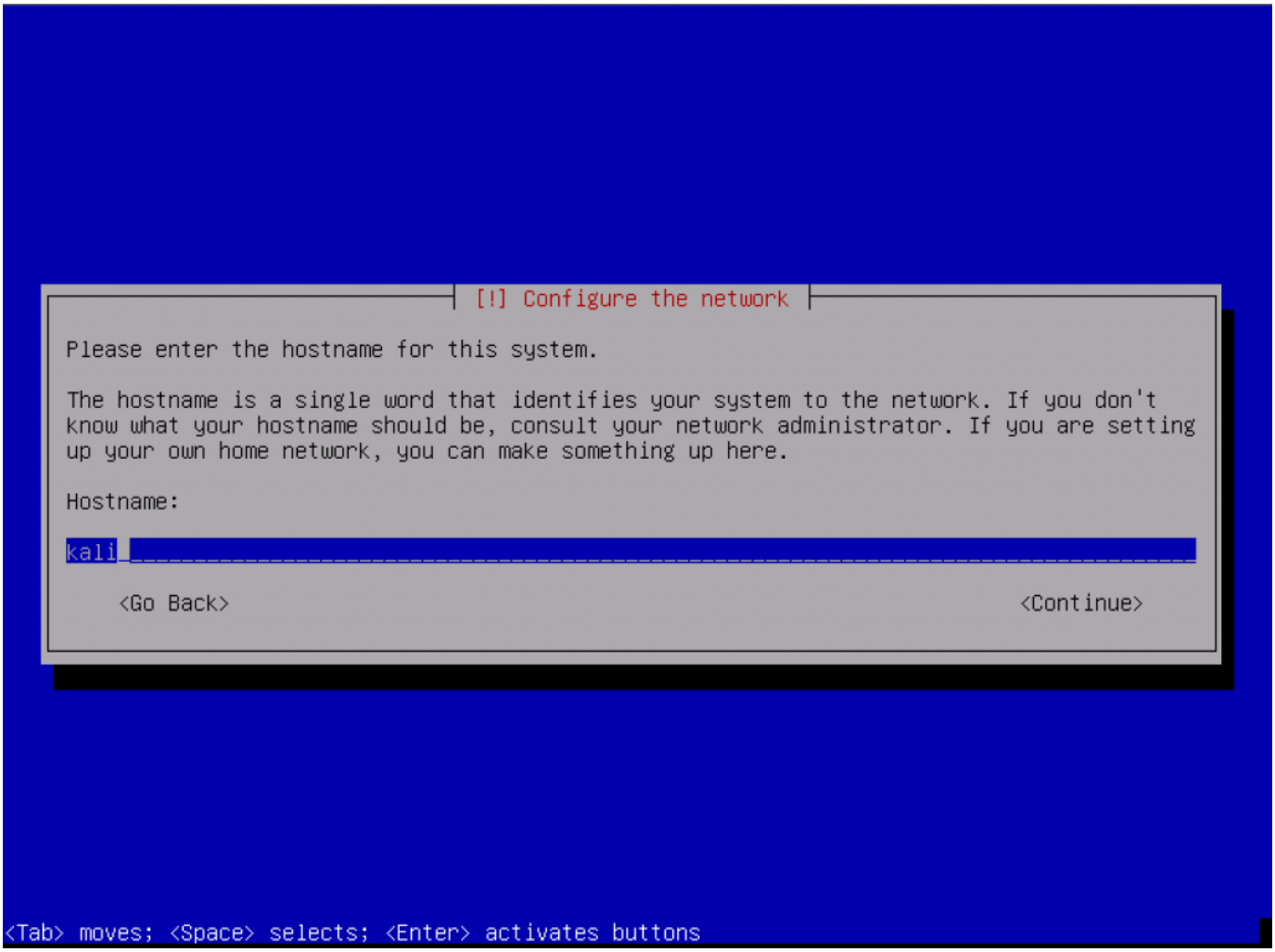
1. Download the Kali mini ISO.
2. Burn The Kali Linux ISO to DVD or Image Kali Linux Live to USB.
3. Ensure that your computer is set to boot from CD / USB in your BIOS.

Kali Linux Installation Procedure

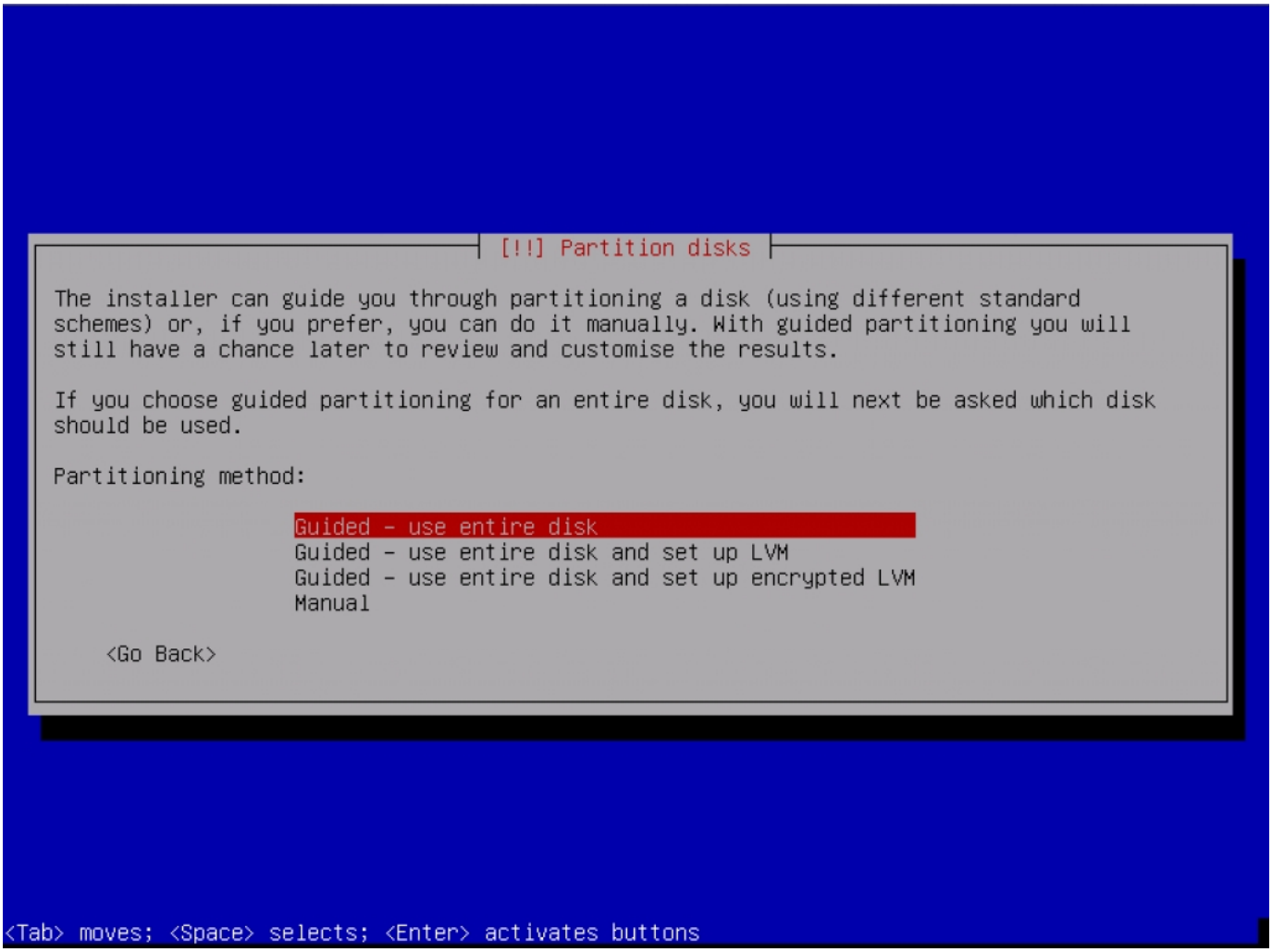
When you first boot the mini ISO, you will be presented with a small boot menu with various options. For this article, we will simply be doing a basic install.



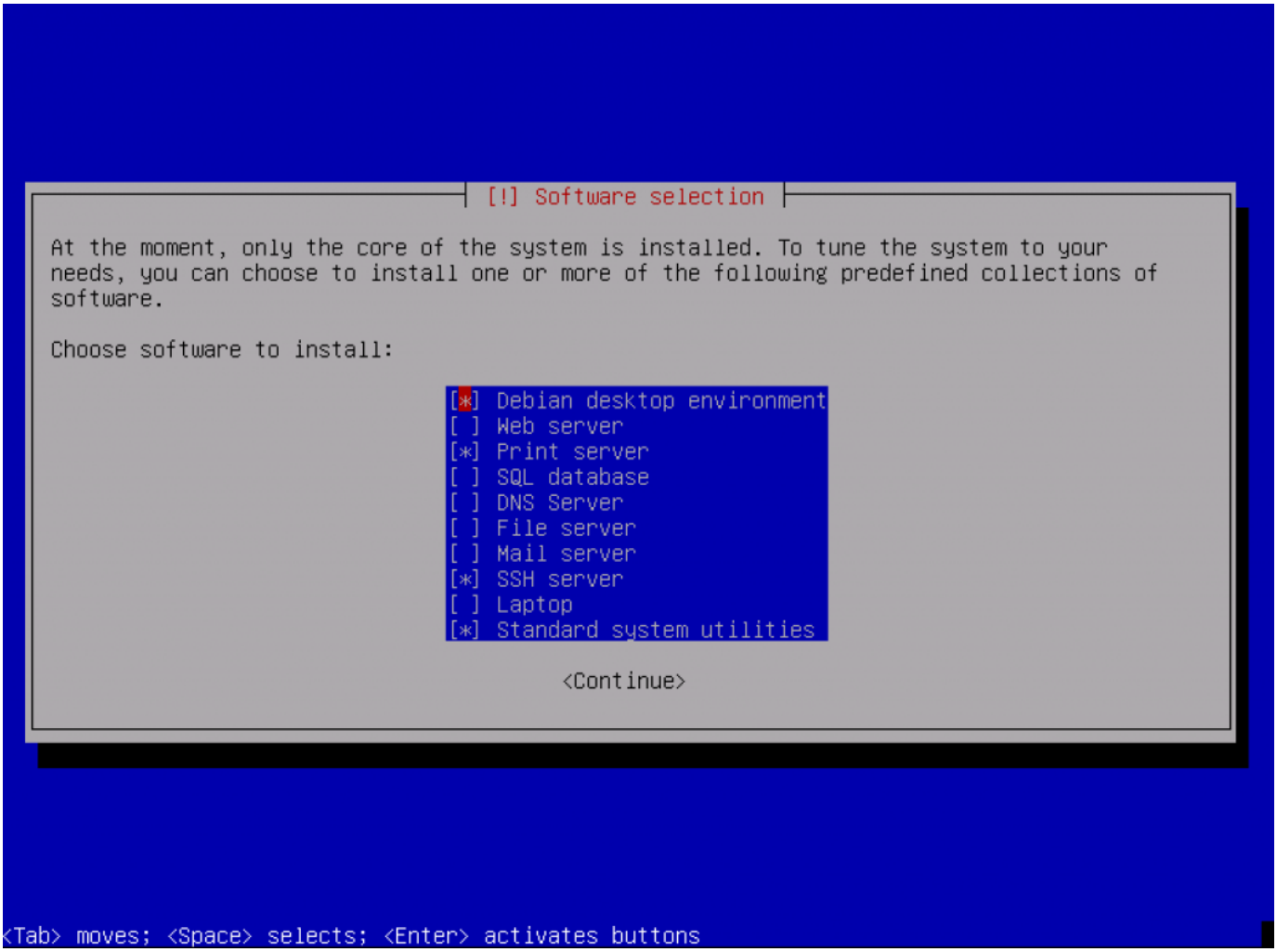
You will next be prompted for various things such as your language and keyboard type, then you will need to select a hostname for your installation. We will stick with the default of *kali*.


[!] Configure the network
Please enter the hostname for this system.
The hostname is a single word that identifies your system to the network. If you don't know what your hostname should be, consult your network administrator. If you are setting up your own home network, you can make something up here.
Hostname:
kali
<Go Back>
<Continue>
<Tab> moves; <Space> selects; <Enter> activates buttons

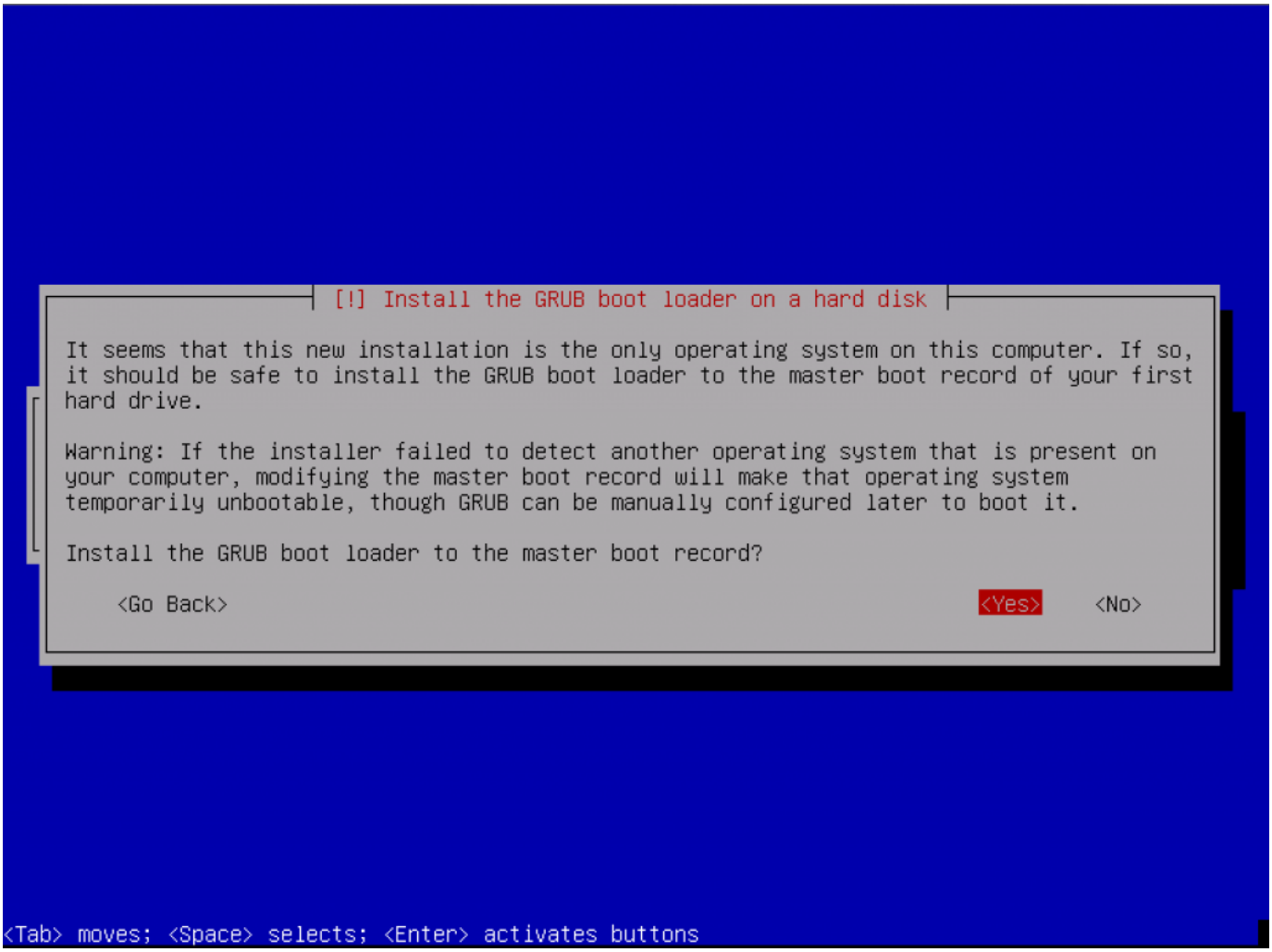
Next, you will need to select your time zone, then you'll be shown the partition options. To get up and running quickly, we will use 'Guided – use entire disk' and follow the prompts all the way through to create the new partitioning setup.


[!!] Partition disks
The installer can guide you through partitioning a disk (using different standard schemes) or, if you prefer, you can do it manually. With guided partitioning you will still have a chance later to review and customise the results.
If you choose guided partitioning for an entire disk, you will next be asked which disk should be used.
Partitioning method:
Guided - use entire disk
Guided - use entire disk and set up LVM
Guided - use entire disk and set up encrypted LVM
Manual
<Go Back>
<Tab> moves; <Space> selects; <Enter> activates buttons

In order to reduce network bandwidth, a small subset of packages will be selected by default. If you wish to add different services or features, this is the area you would make your selections.


[!] Software selection
At the moment, only the core of the system is installed. To tune the system to your needs, you can choose to install one or more of the following predefined collections of software.
Choose software to install:
[*] Debian desktop environment
[ ] Web server
[*] Print server
[ ] SQL database
[ ] DNS Server
[ ] File server
[ ] Mail server
[*] SSH server
[ ] Laptop
[*] Standard system utilities
<Continue>
<Tab> moves; <Space> selects; <Enter> activates buttons

At this point, the installer will download all of the packages it requires and install them on the system. Depending on your Internet connectivity speed, this could take some time. Eventually, you will finally be prompted to install GRUB to finish the installation.


[!] Install the GRUB boot loader on a hard disk
It seems that this new installation is the only operating system on this computer. If so, it should be safe to install the GRUB boot loader to the master boot record of your first hard drive.
Warning: If the installer failed to detect another operating system that is present on your computer, modifying the master boot record will make that operating system temporarily unbootable, though GRUB can be manually configured later to boot it.
Install the GRUB boot loader to the master boot record?
<Go Back>
<Yes>
<No>
<Tab> moves; <Space> selects; <Enter> activates buttons

Post Installation

Now that you've completed installing Kali Linux, it's time to customize your system. The Kali General Use section of our site has more information and you can also find tips on how to get the most out of Kali in our User Forums.

Kali Linux Network PXE Install

/03. Installing Kali Linux /Kali Linux Network PXE Install

Setup a PXE Server

Booting and installing Kali over the network (PXE) can be useful from a single laptop install with no CDROM or USB ports, to enterprise deployments supporting pre-seeding of the Kali installation.

First, we need to install *dnsmasq* to provide the DHCP/TFTP server and then edit the *dnsmasq.conf* file.

```
apt-get install dnsmasq
nano /etc/dnsmasq.conf
```

In *dnsmasq.conf*, enable DHCP, TFTP and PXE booting and set the *dhcp-range* to match your environment. If needed you can also define your gateway and DNS servers with the *dhcp-option* directive as shown below:

```
interface=eth0
dhcp-range=192.168.101.100,192.168.101.200,12h
dhcp-boot=pxelinux.0
enable-tftp
tftp-root=/tftpboot/
dhcp-option=3,192.168.101.1
dhcp-option=6,8.8.8.8,8.8.4.4
```

With the edits in place, the dnsmasq service needs to be restarted in order for the changes to take effect.

```
service dnsmasq restart
```

Download Kali PXE Netboot Images

Now, we need to create a directory to hold the Kali Netboot image and download the image we wish to serve from the Kali repos.

```
mkdir -p /tftpboot
cd /tftpboot
# for 64 bit systems:
wget http://http.kali.org/kali/dists/kali-rolling/main/installer-amd64/current/images/netboot/netboot.tar.gz
# for 32 bit systems:
wget http://http.kali.org/kali/dists/kali-rolling/main/installer-i386/current/images/netboot/netboot.tar.gz
tar zxpf netboot.tar.gz
rm netboot.tar.gz
```

Configure Target to Boot From Network

With everything configured, you can now boot your target system and configure it to boot from the network. It should get an IP address from your PXE server and begin booting Kali.

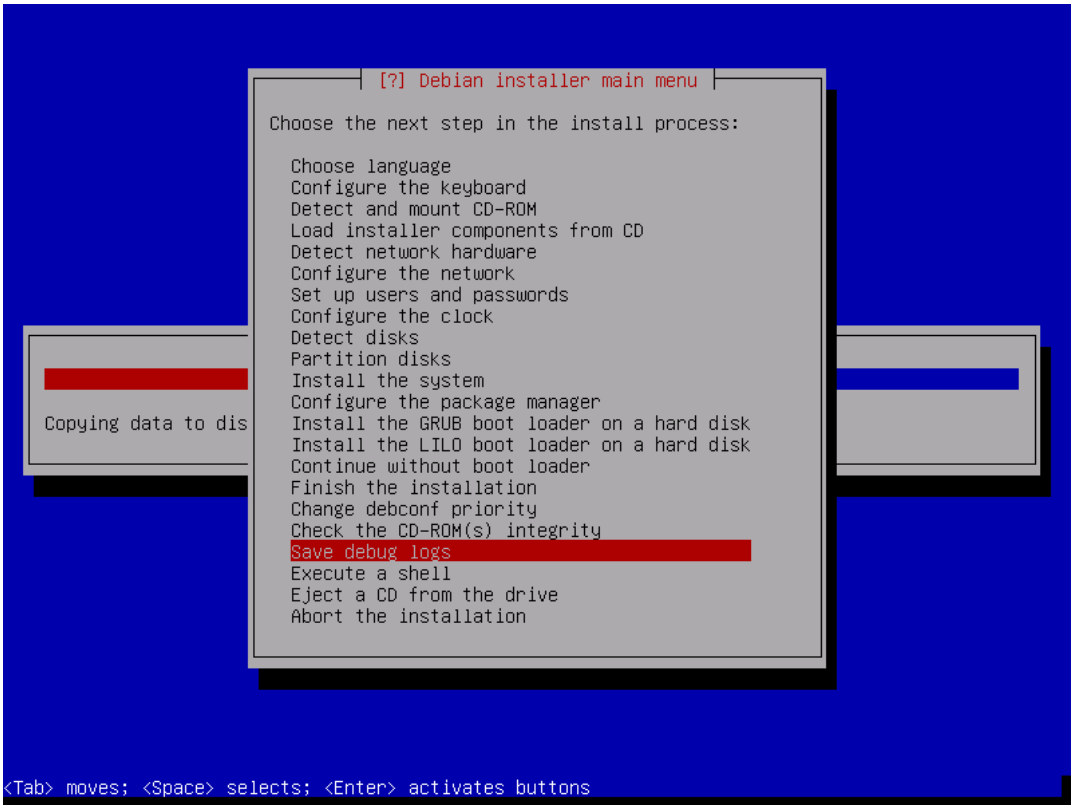
Troubleshooting Installations

/03. Installing Kali Linux /Troubleshooting Installations

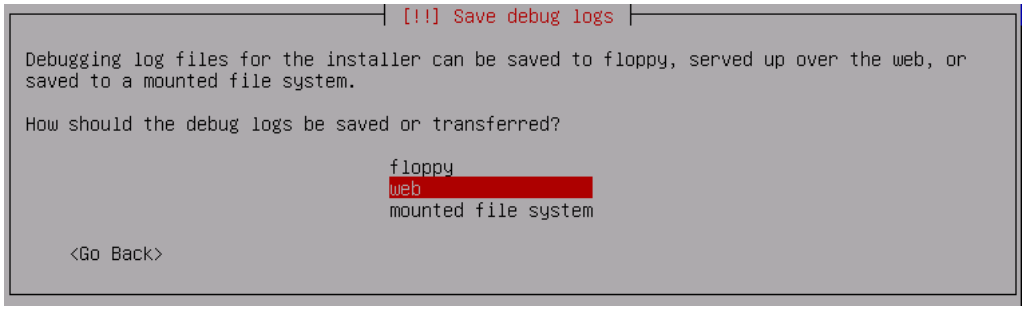
Kali Linux installation failures

There can be a wide variety of reasons for a Kali Linux installation to fail. This could include issues such as a corrupt or incomplete ISO download, not enough disk space on the target machine, etc. The following article will give you some pointers on what to look for when your Kali Linux installation has failed. The following is an example of the dreaded “Red Screen”, indicating the installation encountered a problem.

Hitting the **continue** button should take you to the **Debian installer main menu**. From that main menu, browse to the “**save debug logs**“:


[?] Debian installer main menu
Choose the next step in the install process:
Choose language
Configure the keyboard
Detect and mount CD-ROM
Load installer components from CD
Detect network hardware
Configure the network
Set up users and passwords
Configure the clock
Detect disks
Partition disks
Install the system
Configure the package manager
Install the GRUB boot loader on a hard disk
Install the LILO boot loader on a hard disk
Continue without boot loader
Finish the installation
Change debconf priority
Check the CD-ROM(s) integrity
Save debug logs
Execute a shell
Eject a CD from the drive
Abort the installation
Copying data to dis
<Tab> moves; <Space> selects; <Enter> activates buttons

Going into the debug logs, you are presented with several ways of transferring the installation log files away from the failed installation. The most convenient way is usually to start a web server on the machine undergoing the installation.


[!!] Save debug logs
Debugging log files for the installer can be saved to floppy, served up over the web, or saved to a mounted file system.
How should the debug logs be saved or transferred?
floppy
web
mounted file system
<Go Back>

Once you choose this option, a web server is started from which you are able to download or view several installation log files.

[!!] Save debug logs
Web server started
A simple web server has been started on this computer to serve log files and debug info.
An index of all the available log files can be found at http://192.168.173.239/
<Continue>

Look over the logs files for anything irregular, or any error messages which look like they might be the cause of your failed installation. In this case, the target machine did not have enough disk space to install Kali Linux, as was seen towards the end of the **syslinux** log file

Aug 19 23:45:05 base-installer: error: The tar process copying the live system failed (only 152937 out of 286496 files have been copied, last file was).
Aug 19 23:45:05 main-menu[927]: (process:7553): tar: write error: No space left on device
Aug 19 23:45:05 main-menu[927]: WARNING **: Configuring 'live-installer' failed with error code 1
Aug 19 23:45:05 main-menu[927]: WARNING **: Menu item 'live-installer' failed.
Aug 19 23:50:23 main-menu[927]: INFO: Modifying debconf priority limit from 'high' to 'medium'
Aug 19 23:50:23 debconf: Setting debconf/priority to medium
Aug 19 23:56:49 main-menu[927]: INFO: Menu item 'save-logs' selected

---

SEARCH

Troubleshooting Wireless Drivers

Troubleshooting wireless driver issues in Linux can be a frustrating experience if you don't know what to look for. This article is meant to be used as a general guideline to better help you find the information you need to solve your wireless issues. The most thorough source for wireless driver information is the aircrack-ng documentation.

90% of wireless issues reported to us are due to people not reading the Aircrack-ng documentation. You need to run **airmon-ng check kill** before putting your card in monitor mode.

Carefully read carefully ANY error message as they will VERY OFTEN tell you what's wrong and how to fix it. If not, then use your Google-Fu.

1. No Interface

- Stupid question: Is it a wireless card? (We've seen that several times)
- Is the device plugged in?
- Does it show up on **lsusb** or **lspci** (with the exception of phones)? You might want to update pci ids and usb ids
- Does **dmesg** contain any information about the driver loading and/or failing

- Is Kali a VM? Then, unless your card is USB, it will not be useable (VMWare/VirtualBox/QEMU will virtualize EVERY PCI device). Is it attached to the VM?
- If there is nothing in **dmesg** and it's not in a VM, then you might want to try the latest compat-wireless (and sometimes, you'll need firmware) -> check on Linux-Wireless drivers

2. Interface But Can't Do Anything

- Read error messages
- If there are no error messages, then run **dmesg | tail** and it will most likely tell you what's wrong
- Firmware might be missing
- Check rfkill and any hardware switches and BIOS options

3. No Monitor Mode

- STA drivers (Ralink, Broadcom) and every other manufacturer's provided driver doesn't support monitor mode
- ndiswrapper doesn't support monitor mode AND NEVER WILL.
- Airodump-ng/Wireshark don't show any packets: check rfkill and any hardware switches and BIOS options

4. Injection

- Test with aireplay-ng -9 (Make sure the card is in monitor mode with airmon-ng)
- Airmon-ng doesn't display chipset information: It's not a big issue as it just didn't get that information from the card and doesn't change the abilities of your card
- No injection but monitor mode: Check rfkill and any hardware switches and BIOS options
- Network managers sometimes interfere with Aircrack tools. run **airmon-ng check kill** to kill these processes.

Additional Links

- Will my card work with Aircrack-ng?

- Compat-wireless

AIRCRACK-NG

OFFICIAL AIRCRACK-NG BLOG

THURSDAY, OCTOBER 18, 2012

Will my card work with Aircrack-ng?

Even though there is plenty of documentation on the subject (and most of the time, existing posts about it in the forum), I still see a lot of these questions, especially for new cards.

It's pretty easy to find out and the easiest way is just to try it with a recent version of a pentesting live CD like Backtrack or Pentoo. If your card is detected, you're good to go. You can even use Ubuntu or whetever distro you're comfortable with.
An important thing to note is that what *airmon-ng* says about your chipset is pure information and doesn't affect your card ability to inject/monitor if the driver/card has that capability in the first place obviously.

A few important notes here related to VMware/VirtualBox:

- If your card is internal, it's not gonna work, you must reboot and run the live CD
- If your card is USB and you are running VMware/Virtualbox, then make sure it is attached to the virtual machine. It is explained in the wiki for VMware and it is pretty similar for VirtualBox.

If it doesn't work, the quickest way to find out if it will work is to compile compat-wireless, install it and reboot.
If your card doesn't show up then it might need a firmware. Download it and put it at the right location. Most of the time, a package containing it is available for your distribution; search for "firmware" with your package manager (synaptic/apt-cache/ aptitude on Debian-based distro) and install it.
If you download it manually, check *dmesg* to make sure it doesn't show an error; the message is self-explanatory when it happens.

If your card still doesn't show up (assuming there is no unresolved symbols), then it's probably not gonna work.
In that case, you might want to practice your Google-fu to see if there is a driver in the works.

POSTED BY MISTER_X AT 6:49 PM
LABELS: TUTORIAL

THURSDAY, MARCH 8, 2012

Compat-wireless

We have at least 2 or 3 times a day on IRC the questions about compiling drivers (and more in the forum) and we always say that you have to patch them like explained in the wiki.

As said thousand of times (I just want to avoid having to say it again in the future), you should ALWAYS take the latest compat-wireless version NO MATTER what your kernel version is.

Compat-wireless version is related to the kernel version in a way that it has the features a kernel version has. So, there is no point in taking the same version as your kernel because all you will do is having the features (and not fix anything) that you already had in your kernel (minus the patches from your distro if any were applied).

Compat-wireless with dates (instead of version) is the most up to date and it comes from git. So if you are not a developer (who wants to debug/work with them), then you should not use these.

You can get much more details (and downloads) on Linux Wireless website.

To summarize (or if you don't want to read anything else in this post): ALWAYS take the latest version of compat-wireless (don't take the one with dates).
POSTED BY MISTER_X AT 4:49 PM

04. Kali Linux on ARM(20)

Kali Linux – ASUS Chromebook Flip

/04. Kali Linux on ARM /Kali Linux – ASUS Chromebook Flip
• 04. Kali Linux on ARM

The ASUS Chromebook Flip is a quad core 1.8GHz, with 2GB or 4GB of RAM Chromebook with a 10.1″ 10 point multitouch touchscreen. Kali Linux fits on an external micro SD card or USB key.

Kali on ASUS Chromebook Flip – User Instructions

If all you want to do is install Kali on your ASUS Chromebook Flip, follow these instructions:

1. Get a nice fast 8 GB micro SD card or USB key.
2. Put your Chromebook in developer mode, and enable USB boot. You can ignore legacy boot on that page since these devices do not have SeaBIOS.
3. Download the Kali ASUS Chromebook Flip image from our downloads area.
4. Use the **dd** utility to image this file to your microSD card or USB key. In our example, we use a microSD which is located at */dev/sdb*. ***Change this as needed.***

Alert! This process will wipe out your SD card/USB key. If you choose the wrong storage device, you may wipe out your computers hard disk.

```
xzcat kali-$version-veyron.img.xz | dd of=/dev/sdb bs=512k
```

This process can take awhile depending on your device speed and image size.

Once the *dd* operation is complete, boot up the ASUS Chromebook Flip with the microSD/USB key plugged in. Log in to Kali (***root*** / ***toor***), that's it, you're done!

Kali on ASUS Chromebook Flip – Developer Instructions

If you are a developer and want to tinker with the Kali ASUS Chromebook Flip image, including changing the kernel configuration and generally being adventurous, check out the kali-arm-build-scripts repository on GitHub, and follow the *README.md* file's instructions. The script to use is **chromebook-arm-veyron.sh**

Kali Linux – MiniX

The Mini-X is a dual core 1GHz, with 1GB of RAM. Kali Linux fits on an external micro SD card.

Kali on Mini-X – User Instructions

If all you want to do is install Kali on your Mini-X, follow these instructions:

1. Get a nice fast 8 GB micro SD card.
2. Download the Kali Mini-X image from our downloads area.
3. Use the **dd** utility to image this file to your microSD card. In our example, we use a microSD which is located at ***/dev/sdb***. ***Change this as needed.***

Alert! This process will wipe out your SD card. If you choose the wrong storage device, you may wipe out your computers hard disk.

```
xzcat kali-$version-mini-x.img.xz | dd of=/dev/sdb bs=512k
```

This process can take awhile depending on your device speed and image size.

Once the *dd* operation is complete, boot up the Mini-X with the microSD plugged in. Log in to Kali (***root*** / ***toor***), that's it, you're done!

Kali on Mini-X – Developer Instructions

If you are a developer and want to tinker with the Kali Mini-X image, including changing the kernel configuration and generally being adventurous, check out the kali-arm-build-scriptsrepository on GitHub, and follow the *README.md* file's instructions. The script to use is **mini-x.sh**

i Linux – Cubietruck

/04. Kali Linux on ARM /Kali Linux – Cubietruck
• 04. Kali Linux on ARM

The Cubietruck is a dual core 1GHz, with 2GB of RAM. Kali Linux fits on an external micro SD card.

Kali on Cubietruck – User Instructions

If all you want to do is install Kali on your Cubietruck, follow these instructions:

1. Get a nice fast 8 GB micro SD card.
2. Download the Kali Cubietruck image from our downloads area.

3. Use the **dd** utility to image this file to your microSD card. In our example, we use a microSD which is located at ***/dev/sdb***. ***Change this as needed.***

Alert! This process will wipe out your SD card. If you choose the wrong storage device, you may wipe out your computers hard disk.

```
xzcat kali-$version-cubietruck.img.xz | dd of=/dev/sdb bs=512k
```

This process can take awhile depending on your device speed and image size.

Once the *dd* operation is complete, boot up the Cubietruck with the microSD plugged in. Log in to Kali (***root*** / ***toor***), that's it, you're done!

Kali on Cubietruck – Developer Instructions

If you are a developer and want to tinker with the Kali Cubietruck image, including changing the kernel configuration and generally being adventurous, check out the kali-arm-build-scripts repository on GitHub, and follow the *README.md* file's instructions. The script to use is **cubietruck.sh**

Kali Linux – Raspberry Pi2

/04. Kali Linux on ARM /Kali Linux – Raspberry Pi2

• 04. Kali Linux on ARM

The Raspberry Pi2 is a quad core 900MHz, with 1GB of RAM. Kali Linux fits on an external micro SD card.

Kali on Raspberry Pi2 – User Instructions

If all you want to do is install Kali on your Raspberry Pi2, follow these instructions:

1. Get a nice fast 8 GB micro SD card or eMMC.
2. Download the Kali Raspberry Pi2 image from our downloads area.
3. Use the **dd** utility to image this file to your microSD card. In our example, we use a microSD which is located at ***/dev/sdb***. ***Change this as needed.***

This process will wipe out your SD card. If you choose the wrong storage device, you may wipe out your computers hard disk.

```
xzcat kali-$version-rpi2.img.xz | dd of=/dev/sdb bs=512k
```

This process can take awhile depending on your device speed and image size.

Once the *dd* operation is complete, boot up the Raspberry Pi2 with the microSD plugged in. Log in to Kali (***root*** / ***toor***), that's it, you're done!

Kali on Raspberry Pi2 – Developer Instructions

If you are a developer and want to tinker with the Kali Raspberry Pi2 image, including changing the kernel configuration and generally being adventurous, check out the kali-arm-build-scripts repository on GitHub, and follow the *README.md* file's instructions. The script to use is **rpi2.sh**

li Linux – Trimslice

/04. Kali Linux on ARM /Kali Linux – Trimslice

• 04. Kali Linux on ARM

The Trimslice is a dual core 1GHz, with 1GB of RAM. Kali Linux fits on an external micro SD card.

Kali on Trimslice – User Instructions

If all you want to do is install Kali on your Trimslice, follow these instructions:

1. Get a nice fast 8 GB micro SD card or eMMC.
2. Download the Kali Trimslice image from our downloads area.
3. Use the **dd** utility to image this file to your microSD card. In our example, we use a microSD which is located at ***/dev/sdb***. ***Change this as needed.***

This process will wipe out your SD card. If you choose the wrong storage device, you may wipe out your computers hard disk.

```
xzcat kali-$version-trimslice.img.xz | dd of=/dev/sdb bs=512k
```

This process can take awhile depending on your device speed and image size.

Once the *dd* operation is complete, boot up the Trimslice with the microSD plugged in. Log in to Kali (***root*** / ***toor***), that's it, you're done!

Kali on Trimslice – Developer Instructions

If you are a developer and want to tinker with the Kali Trimslice image, including changing the kernel configuration and generally being adventurous, check out the kali-arm-build-scripts repository on GitHub, and follow the *README.md* file's instructions. The script to use is **trimslice.sh**

Kali Linux – Cubieboard2

/04. Kali Linux on ARM /Kali Linux – Cubieboard2

• 04. Kali Linux on ARM

The Cubieboard2 is a dual core 1.4GHz, with 1GB of RAM. Kali Linux fits on an external micro SD card.

Kali on Cubieboard2 – User Instructions

If all you want to do is install Kali on your Cubieboard2, follow these instructions:

1. Get a nice fast 8 GB micro SD card or eMMC.
2. Download the Kali Cubieboard2 image from our downloads area.
3. Use the **dd** utility to image this file to your microSD card. In our example, we use a microSD, which is located at ***/dev/sdb***. ***Change this as needed.***

This process will wipe out your SD card. If you choose the wrong storage device, you may wipe out your computers hard disk.

```
xzcat kali-$version-cubieboard2.img.xz | dd of=/dev/sdb bs=512k
```

This process can take awhile depending on your device speed and image size.

Once the *dd* operation is complete, boot up the Cubieboard2 with the microSD plugged in. Log in to Kali (***root*** / ***toor***), that's it, you're done!

Kali on Cubieboard2 – Developer Instructions

If you are a developer and want to tinker with the Kali Cubieboard2 image, including changing the kernel configuration and generally being adventurous, check out the kali-arm-build-scripts repository on GitHub, and follow the *README.md* file's instructions. The script to use is **cubieboard2.sh**

Kali Linux – RIoTboard

/04. Kali Linux on ARM /Kali Linux – RIoTboard

• 04. Kali Linux on ARM

The RIoTboard is a Cortex A9 1GHz, with 1GB of RAM. Kali Linux fits on an external micro SD card.

Kali on RIoTboard – User Instructions

If all you want to do is install Kali on your RIoTboard, follow these instructions:

1. Get a nice fast 8 GB micro SD card or eMMC.
2. Download the Kali RIoTboard image from our downloads area.
3. Use the **dd** utility to image this file to your microSD card. In our example, we use a microSD which is located at ***/dev/sdb***. ***Change this as needed.***

This process will wipe out your SD card. If you choose the wrong storage device, you may wipe out your computers hard disk.

```
xzcat kali-$version-riot.img.xz | dd of=/dev/sdb bs=512k
```

This process can take awhile depending on your device speed and image size.

Once the *dd* operation is complete, boot up the RIoTboard with the microSD plugged in. Log in to Kali (***root*** / ***toor***), that's it, you're done!

Kali on RIoTboard – Developer Instructions

If you are a developer and want to tinker with the Kali RIoTboard image, including changing the kernel configuration and generally being adventurous, check out the kali-arm-build-scripts repository on GitHub, and follow the *README.md* file's instructions. The script to use is **riot.sh**

Kali Linux – NanoPi2

The NanoPi2 is a quad core 1.9GHz, with 1GB of RAM. Kali Linux fits on an external micro SD card.

Kali on NanoPi2 – User Instructions

If all you want to do is install Kali on your NanoPi2, follow these instructions:

1. Get a nice fast 8 GB micro SD card or eMMC.
2. Download the Kali NanoPi2 image from our downloads area.
3. Use the **dd** utility to image this file to your microSD card. In our example, we use a microSD which is located at ***/dev/sdb***. ***Change this as needed.***

This process will wipe out your SD card. If you choose the wrong storage device, you may wipe out your computers hard disk.

```
xzcat kali-$version-nanopi2.img.xz | dd of=/dev/sdb bs=512k
```

This process can take awhile depending on your device speed and image size.

Once the *dd* operation is complete, boot up the NanoPi2 with the microSD plugged in. Log in to Kali (***root*** / ***toor***), that's it, you're done!

Kali on NanoPi2 – Developer Instructions

If you are a developer and want to tinker with the Kali NanoPi2 image, including changing the kernel configuration and generally being adventurous, check out the kali-arm-build-scriptsrepository on GitHub, and follow the *README.md* file's instructions. The script to use is **nanopi2.sh**

Kali Linux – Utilite Pro

/04. Kali Linux on ARM /Kali Linux – Utilite Pro

• 04. Kali Linux on ARM

The Utilite Pro is a quad core 1.2GHz Cortex A9, with 2GB of RAM. Kali Linux fits on an external micro SD card.

Kali on Utilite Pro – User Instructions

If all you want to do is install Kali on your Utilite Pro, follow these instructions:

1. Get a nice fast 8 GB micro SD card or eMMC.
2. Download the Kali Utilite image from our downloads area.
3. Use the **dd** utility to image this file to your microSD card. In our example, we use a microSD which is located at ***/dev/sdb***. ***Change this as needed.***

Alert! This process will wipe out your SD card. If you choose the wrong storage device, you may wipe out your computers hard disk.

```
xzcat kali-$version-utilite.img.xz | dd of=/dev/sdb bs=512k
```

This process can take awhile depending on your device speed and image size.

Once the *dd* operation is complete, boot up the Utilite Pro with the microSD plugged in. Log in to Kali (***root*** / ***toor***), that's it, you're done!

Kali on Utilite – Developer Instructions

If you are a developer and want to tinker with the Kali Utilite Pro image, including changing the kernel configuration and generally being adventurous, check out the kali-arm-build-scripts repository on GitHub, and follow the *README.md* file's instructions. The script to use is **utilite.sh**

Kali Linux – ODROID-C1

/04. Kali Linux on ARM /Kali Linux – ODROID-C1

• 04. Kali Linux on ARM

The ODROID-C1 is a quad core 1.5GHz Cortex A5, with 1GB of RAM development board. Kali Linux fits on an external micro SD card or on an eMMC module.

Kali on ODROID-C1 – User Instructions

If all you want to do is install Kali on your ODROID-C1, follow these instructions:

1. Get a nice fast 8 GB micro SD card or eMMC.
2. Download the Kali ODROID-C1 image from our downloads area.
3. Use the **dd** utility to image this file to your microSD/eMMC device. In our example, we use a microSD which is located at ***/dev/sdb***. ***Change this as needed.***

Alert! This process will wipe out your SD card. If you choose the wrong storage device, you may wipe out your computers hard disk.

```
xzcat kali-$version-odroidc.img.xz | dd of=/dev/sdb bs=512k
```

This process can take awhile depending on your device speed and image size.

Once the *dd* operation is complete, boot up the ODROID-C1 with the SD / eMMC plugged in. Log in to Kali (***root*** / ***toor***), that's it, you're done!

Kali on ODROID-C1 – Developer Instructions

If you are a developer and want to tinker with the Kali ODROID-C1 image, including changing the kernel configuration and generally being adventurous, check out the kali-arm-build-scripts repository on GitHub, and follow the *README.md* file's instructions. The script to use is **odroid-c.sh**

Kali Linux on USB Armory

/04. Kali Linux on ARM /Kali Linux on USB Armory

• 04. Kali Linux on ARM

The USB armory from Inverse Path is an open source hardware design, implementing a flash drive sized computer. Kali Linux fits on a micro SD card for it.

Kali on USB armory – User Instructions

If all you want to do is install Kali on your USB armory, follow these instructions:

1. Get a nice fast 8 GB micro SD card.
2. Download the Kali USB armory image from our downloads area.
3. Use the **dd** utility to image this file to your microSD device. In our example, we use a microSD which is located at ***/dev/sdb***. ***Change this as needed.***

This process will wipe out your SD card. If you choose the wrong storage device, you may wipe out your computers hard disk.

```
xzcat kali-$version-usbarmory.img.xz | dd of=/dev/sdb bs=512k
```

This process can take awhile depending on your device speed and image size.

Once the *dd* operation is complete, boot up a computer with the USB armory plugged in. Log in to Kali (***root*** / ***toor***), that's it, you're done!

Kali on USB armory – Developer Instructions

If you are a developer and want to tinker with the Kali USB armory image, including changing the kernel configuration and generally being adventurous, check out the kali-arm-build-scripts repository on GitHub, and follow the *README.md* file's instructions. The script to use is **usbarmory.sh**

Kali Linux on Acer Tegra Chromebook 13″

/04. Kali Linux on ARM /Kali Linux on Acer Tegra Chromebook 13″

The Acer Tegra Chromebook is an ultraportable laptop. It was quite a challenge, but we have a Kali image that runs great on the Chromebook. Boasting a Tegra K1 2.1GHz quad core processor and 4 GB of RAM, the Chromebook is a fast ARM laptop. Kali linux fits on an external SD card on this machine which leaves the internal disk untouched.

Kali on Chromebook – User Instructions

If all you want to do is install Kali on your Acer Tegra Chromebook, follow these instructions:

1. Get a nice fast 8 GB SD card.
2. Put your Chromebook in developer mode, and enable USB boot.
3. Download the Kali Acer Tegra Chromebook image from our downloads area.
4. Use the **dd** utility to image this file to your SD card device. In our example, we use an SD Card which is located at ***/dev/sdb***. ***Change this as needed.***

Alert! This process will wipe out your SD card. If you choose the wrong storage device, you may wipe out your computers hard disk.

```
xzcat kali-$version-acer.img | dd of=/dev/sdb bs=512k
```

This process can take awhile depending on your storage device speed and image size.

Once the *dd* operation is complete, boot up the Chromebook with the SD card plugged in. At the developer boot prompt, hit CTRL+U, which should boot you into Kali Linux. Log in to Kali (***root*** / ***toor***). That's it, you're done!

Kali on Acer Tegra Chromebook – Developer Instructions

If you are a developer and want to tinker with the Kali Acer Chromebook image, including changing the kernel configuration and generally being adventurous, check out the kali-arm-build-scripts repository on GitHub, and follow the *README.md* file's instructions. The script to use is **chromebook-arm-acer.sh**

Kali Linux on Acer Tegra Chromebook 13″

The Acer Tegra Chromebook is an ultraportable laptop. It was quite a challenge, but we have a Kali image that runs great on the Chromebook. Boasting a Tegra K1 2.1GHz quad core

processor and 4 GB of RAM, the Chromebook is a fast ARM laptop. Kali linux fits on an external SD card on this machine which leaves the internal disk untouched.

Kali on Chromebook – User Instructions

If all you want to do is install Kali on your Acer Tegra Chromebook, follow these instructions:

1. Get a nice fast 8 GB SD card.
2. Put your Chromebook in developer mode, and enable USB boot.
3. Download the Kali Acer Tegra Chromebook image from our downloads area.
4. Use the **dd** utility to image this file to your SD card device. In our example, we use an SD Card which is located at ***/dev/sdb***. ***Change this as needed.***

Alert! This process will wipe out your SD card. If you choose the wrong storage device, you may wipe out your computers hard disk.

```
xzcat kali-$version-acer.img | dd of=/dev/sdb bs=512k
```

This process can take awhile depending on your storage device speed and image size.

Once the *dd* operation is complete, boot up the Chromebook with the SD card plugged in. At the developer boot prompt, hit CTRL+U, which should boot you into Kali Linux. Log in to Kali (***root*** / ***toor***). That's it, you're done!

Kali on Acer Tegra Chromebook – Developer Instructions

If you are a developer and want to tinker with the Kali Acer Chromebook image, including changing the kernel configuration and generally being adventurous, check out the kali-arm-build-scripts repository on GitHub, and follow the *README.md* file's instructions. The script to use is **chromebook-arm-acer.sh**

Kali Linux on ODROID-XU3

/04. Kali Linux on ARM /Kali Linux on ODROID-XU3

• 04. Kali Linux on ARM

The ODROID-XU3 is an octacore development board. Boasting 4 A15 cores and 4 A7 cores and 4 GB of RAM, the ODROID-XU3 is a fast ARM device. Kali linux fits on an external micro SD card or on an eMMC module.

Kali on ODROID-XU3 – User Instructions

If all you want to do is install Kali on your ODROID-XU3, follow these instructions:

1. Get a nice fast 8 GB micro SD card or eMMC.
2. Download the Kali ODROID-XU3 image from our downloads area.
3. Use the **dd** utility to image this file to your microSD/eMMC device. In our example, we use a microSD which is located at ***/dev/sdb***. ***Change this as needed.***

This process will wipe out your SD card. If you choose the wrong storage device, you may wipe out your computers hard disk.

```
xzcat kali-$version-odroidxu3.img.xz | dd of=/dev/sdb bs=512k
```

This process can take awhile depending on your device speed and image size.

Once the *dd* operation is complete, boot up the ODROID-XU3 with the SD / eMMC plugged in. Log in to Kali (***root*** / ***toor***), that's it, you're done!

Kali on ODROID-XU3 – Developer Instructions

If you are a developer and want to tinker with the Kali ODROID-XU3 image, including changing the kernel configuration and generally being adventurous, check out the kali-arm-build-scripts repository on GitHub, and follow the *README.md* file's instructions. The script to use is **odroid-xu3.sh**

Kali Linux – CuBox-i4Pro

/04. Kali Linux on ARM /Kali Linux – CuBox-i4Pro

• 04. Kali Linux on ARM

The SolidRun CuBox-i4Pro is the "world's smallest computer". The specifications are Quad core i.MX6 1GHZ processor, 2GB RAM, Gbit ethernet, eSata port, and MicroSD slot.

Kali on Cubox-i4 Pro – User Instructions

If all you want to do is install Kali on your CuBox-i4Pro, follow these instructions:

1. Get a nice fast 8 GB micro SD card.
2. Download the Kali Cubox-i image from our downloads area.
3. Use the **dd** utility to image this file to your SD device. In our example, we use a MicroSD which is located at ***/dev/sdb***. ***Change this as needed.***

This process will wipe out your SD card. If you choose the wrong storage device, you may wipe out your computers hard disk.

```
xzcat kali-$version-cubox-i.img.xz | dd of=/dev/sdb bs=512k
```

This process can take awhile depending on your device speed and image size.

Once the *dd* operation is complete, boot up the CuBox-i4Pro with the MicroSD plugged in. Log in to Kali (***root*** / ***toor***), that's it, you're done!

Kali on SolidRun Cubox-i4pro – Developer Instructions

If you are a developer and want to tinker with the Kali CuBox-i4Pro image, including changing the kernel configuration and generally being adventurous, check out the kali-arm-build-scripts repository on GitHub, and follow the *README.md* file's instructions. The script to use is **cubox-i.sh**

Kali Linux – Samsung Chromebook 2

/04. Kali Linux on ARM /Kali Linux – Samsung Chromebook 2

• 04. Kali Linux on ARM

The Samsung ARM Chromebook 2 is an ultraportable laptop. It was quite a challenge, but we have a Kali image that runs great on the Chromebook. Boasting an Exynos 5800 1.7GHz quad core processor and 4 GB of RAM, the Chromebook 2 is a fast ARM laptop. Kali Linux fits on an external micro SD card on this machine which leaves the internal disk untouched.

Kali on Chromebook 2 – User Instructions

If all you want to do is install Kali on your Samsung ARM Chromebook 2, follow these instructions:

1. Get a nice fast 8 GB micro SD card.
2. Put your Chromebook in developer mode, and enable USB boot.
3. Download the Kali Samsung ARM Chromebook 2 image from our downloads area.
4. Use the **dd** utility to image this file to your SD device. In our example, we use a micro SD card which is located at ***/dev/sdb***. ***Change this as needed.***

This process will wipe out your SD card. If you choose the wrong storage device, you may wipe out your computers hard disk.

```
xzcat kali-$ver-exynos.img.xz | dd of=/dev/sdb bs=512k
```

This process can take awhile depending on your device speed and image size.

Once the *dd* operation is complete, boot up the Chromebook with the SD card plugged in. At the developer boot prompt, hit CTRL+U, which should boot you into Kali Linux. Log in to Kali (***root*** / ***toor***), that's it, you're done!

Kali on Samsung Chromebook 2 – Developer Instructions

If you are a developer and want to tinker with the Kali Samsung Chromebook 2 image, including changing the kernel configuration and generally being adventurous, check out the kali-arm-build-scripts repository on GitHub, and follow the *README.md* file's instructions. The script to use is **chromebook-arm-exynos.sh**

05. Using Kali Linux(6)

Kali sources.list Repositories

/05. Using Kali Linux /Kali sources.list Repositories

• 05. Using Kali Linux

The single most common causes of a broken Kali Linux installation are following unofficial advice, and particularly arbitrarily populating the system's **sources.list** file with unofficial repositories. The following post aims to clarify what repositories should exist in **sources.list**, and when they should be used.

Any additional repositories added to the Kali sources.list file will most likely *BREAK YOUR KALI LINUX INSTALL*.

Regular repositories

On a standard, clean install of Kali Linux, you should have the following entry present in **/etc/apt/sources.list**:

```
deb http://http.kali.org/kali kali-rolling main non-free contrib
```

You can find a list of official Kali Linux mirrors here.

Source repositories

In case you require source packages, you might also want to add the following repositories as well:

```
deb-src http://http.kali.org/kali kali-rolling main non-free contrib
```

The kali-dev repository

WARNING: While kali-dev is publicly accessible to everybody on all Kali mirrors, this distribution should not be used by end-users as it will regularly break.

This repository is actually Debian's Testing distribution with all the kali-specific packages (available in the kali-dev-only repository) force-injected. Kali packages take precedence over the Debian packages. Sometimes when Testing changes, some Kali packages must be updated and this will not happen immediately. During this time, kali-dev is likely to be broken. This repository is where Kali developers push updated packages and is the basis used to create kali-rolling.

The kali-rolling repository

Contrary to kali-dev, kali-rolling is expected to be of better quality because it's managed by a tool that ensures installability of all the package it contains. That tool picks updated packages from kali-dev and copies them to kali-rolling only when they have been verified to be installable. Note however that those checks do not include any functional testing. It might still contain broken software due to other problems that are not covered by the package dependencies. **Kali Rolling is the primary repository that most users should be using.**They can also report any issue they have with Kali specific packages on bugs.kali.org. Make sure to select the "kali-dev" version in "Product version".

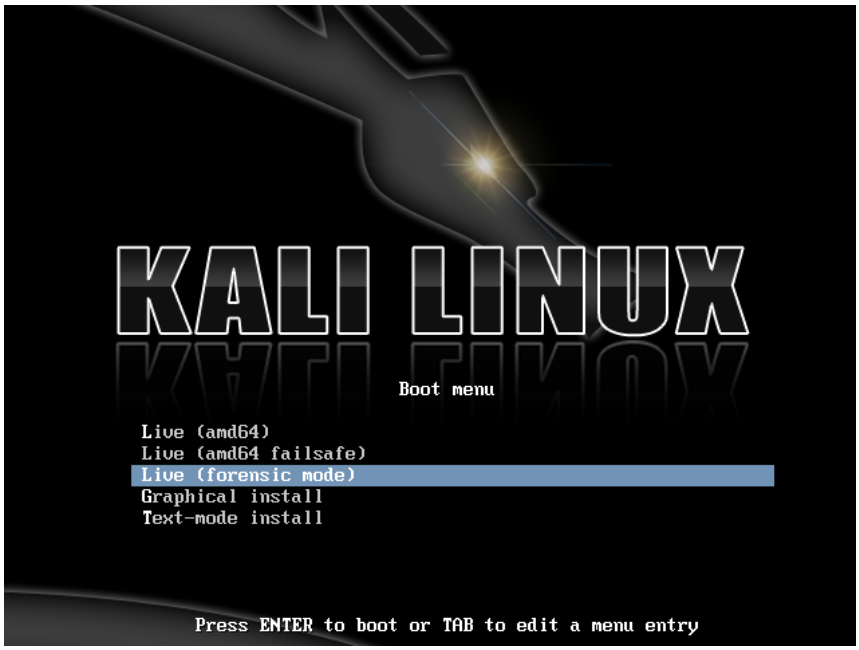
Kali Rolling users are expected to have the following entries in their sources.list:

```
deb http://http.kali.org/kali kali-rolling main non-free contrib
```

Kali Linux Forensics Mode

Kali Linux "Live" provides a "forensic mode", a feature first introduced in BackTrack Linux. The "Forensic mode live boot" option has proven to be very popular for several reasons:

- Kali Linux is widely and easily available, many potential users already have Kali ISOs or bootable USB drives.
- When a forensic need comes up, Kali Linux “Live” makes it quick and easy to put Kali Linux on the job.
- Kali Linux comes pre-loaded with the most popular open source forensic software, a handy toolkit when you need to do forensic work.



When booted into the forensic boot mode, there are a few *very important changes* to the regular operation of the system:

1. First, the internal hard disk is *never* touched. If there is a swap partition it will *not* be used and no internal disk will be auto mounted. We verified this by first taking a standard system and removing the hard drive. A hash was taken of the drive using a commercial forensic package. We then reattached the drive to the computer and booted Kali Linux “Live” in forensic mode. After using Kali for a period of time, we then shut the system down, removed the hard drive, and took the hash again. These hashes matched, indicating that at no point was anything changed on the drive in any way.

2. The other, equally important, change is that auto-mounting of removable media is ***disabled***. USB thumb drives, CDs, and the like will ***not*** be auto-mounted when inserted. The idea behind this is simple: in forensic mode, ***nothing*** should happen to ***any*** media without ***direct user action***. *Anything* that you do as a user is *on you*.

If you plan on using Kali for real world forensics of any type, we recommend that you don't just take our word for any of this. All forensic tools should *always* be validated to ensure that you know how they will behave in any circumstance in which you are going to be using them.

Finally, while Kali continues to focus on providing the best collection of open source penetration testing tools available, it is always possible that we may have missed *your*favorite open source forensic tool. If so, let us know! We are always on the lookout of high quality open source tools that we can add to Kali to make it even better.

Metasploit Framework

/05. Using Kali Linux /Metasploit Framework

• 05. Using Kali Linux

In keeping with the Kali Linux Network Services Policy, no network services, *including*database services, run on boot as a default, so there are a couple of steps that need to be taken in order to get Metasploit up and running with database support.

Start the Kali PostgreSQL Service

Metasploit uses **PostgreSQL** as its database so it needs to be launched first.

```
service postgresql start
```

You can verify that **PostgreSQL** is running by checking the output of **ss -ant** and making sure that port 5432 is listening.

```
State Recv-Q Send-Q Local Address:Port Peer Address:Port
LISTEN 0 128 :::22 :::*
LISTEN 0 128 *:22 *:*
LISTEN 0 128 127.0.0.1:5432 *:*
LISTEN 0 128 ::1:5432 :::*
```

Initialise the Metasploit PostgreSQL Database

With **PostgreSQL** up and running, we next need to create and initialize the **msf** database.

```
msfdb init
```

Launch msfconsole in Kali

Now that the **PostgreSQL** service is up and running and the database is initialized, you can launch **msfconsole** and verify database connectivity with the **db_status** command as shown below.

```
msfconsole
```

```
msf > db_status
[*] postgresql connected to msf3
msf >
```

Install NVIDIA GPU Drivers on Kali Linux

/05. Using Kali Linux /Install NVIDIA GPU Drivers on Kali Linux

• 05. Using Kali Linux

This document explains how to install NVIDIA GPU drivers and CUDA support, allowing integration with popular penetration testing tools.

Prerequisites

First, you'll need to ensure that your system is fully upgraded and that your card supports CUDA.

Note: GPUs with a CUDA compute capability > 5.0 are recommended, but GPUs with less will still work.

```
apt update && apt dist-upgrade -y && reboot
```

Let's determine the exact GPU installed, and check the kernel modules it's using.

```
root@kali:~# lspci -v
01:00.0 VGA compatible controller: NVIDIA Corporation GM204 [GeForce GTX 970] (rev a1) (prog-if 00 [VGA controller])
	Subsystem: ZOTAC International (MCO) Ltd. GM204 [GeForce GTX 970]
	Region 1: Memory at e0000000 (64-bit, prefetchable) [size=256M]
	Capabilities: [60] Power Management version 3
	Capabilities: [68] MSI: Enable+ Count=1/1 Maskable- 64bit+
	Capabilities: [78] Express (v2) Legacy Endpoint, MSI 00
	Capabilities: [600 v1] Vendor Specific Information: ID=0001 Rev=1 Len=024
	Kernel driver in use: nouveau
	Kernel modules: nouveau
```

Installation

Once the system has rebooted, we will proceed to install the **OpenCL ICD Loader**, **Drivers**, and the **CUDA toolkit**.

```
apt install -y ocl-icd-libopencl1 nvidia-driver nvidia-cuda-toolkit
```

During installation of the drivers the system created new kernel modules, so another reboot is required.

Verify Driver Installation

Now that our system should be ready to go, we need to verify the drivers have been loaded correctly. We can quickly verify this by running the nvidia-smi tool.

```
root@kali:~# nvidia-smi
+-----------------------------------------------------------------------------+
| NVIDIA-SMI 375.26                 Driver Version: 375.26                    |
|-------------------------------+----------------------+----------------------+
| GPU  Name        Persistence-M| Bus-Id        Disp.A | Volatile Uncorr. ECC |
| Fan  Temp  Perf  Pwr:Usage/Cap|         Memory-Usage | GPU-Util  Compute M. |
|                               |                      |                      |
|===============================+======================+======================|
|   0  GeForce GTX 970     Off  | 0000:01:00.0      On |                  N/A |
| 36%   46C    P0    47W / 325W |    200MiB /  4036MiB |      0%      Default |
+-------------------------------+----------------------+----------------------+

+-----------------------------------------------------------------------------+
| Processes:                                                       GPU Memory |
|  GPU       PID  Type  Process name                               Usage      |
|                                                                             |
|=============================================================================|
|    0       692    G   /usr/lib/xorg/Xorg                           198MiB |
+-----------------------------------------------------------------------------+
```

With the output displaying our driver and GPU correctly, we can now dive into benchmarking. Before we get too far ahead, let’s double check to make sure hashcat and CUDA are working together.

```
root@kali:~# hashcat -I
OpenCL Info:
Platform ID #1
  Vendor  : NVIDIA Corporation
  Name    : NVIDIA CUDA
  Version : OpenCL 1.2 CUDA 8.0.0
  Device ID #1
    Type           : GPU
    Vendor ID      : 32
    Vendor         : NVIDIA Corporation
    Name           : GeForce GTX 970
    Version        : OpenCL 1.2 CUDA
    Processor(s)   : 13
    Clock          : 1240
    Memory         : 1009/4036 MB allocatable
    OpenCL Version : OpenCL C 1.2
    Driver Version : 375.26
```

It appears everything is working, let's go ahead and run a benchmark test.

Benchmarking

```
root@kali:~# hashcat -b
OpenCL Platform #1: NVIDIA Corporation
======================================
* Device #1: Geforce GTX 970, 1009/4095 MB allocatable, 13MCU

Hashtype: MD5
Speed.Dev.#1.....: 10443.1 MH/s
Hashtype: SHA1
Speed.Dev.#1.....: 3349.8 MH/s
Hashtype: SHA256
Speed.Dev.#1.....: 1321.8 MH/s
```

There are a multitude of configurations to improve cracking speed, not mentioned in this guide. However, we encourage you to take a look at the hashcat documentation for your specific cases.

Troubleshooting

In the event setup isn't going as planned, we'll install clinfo for detailed troubleshooting information.

```
apt install -y clinfo
```

OpenCL Loaders

It may be necessary to check for additional packages that may be conflicting with our setup. Let's first check to see what **OpenCL Loader** we have installed. The NVIDIA OpenCL Loader and the generic OpenCL Loader will both work for our system.

```
root@kali:~# dpkg -l |grep -i icd
ii  nvidia-egl-icd:amd64                375.26-2                amd64        NVIDIA EGL installable client driver (ICD)
ii  nvidia-opencl-icd:amd64             375.26-2                amd64        NVIDIA OpenCL installable client driver (ICD)
ii  nvidia-vulkan-icd:amd64             375.26-2                amd64        NVIDIA Vulkan installable client driver (ICD)
ii  ocl-icd-libopencl1:amd64            2.2.11-1                amd64        Generic OpenCL ICD Loader
```

If **mesa-opencl-icd** is installed run:

```
apt remove mesa-opencl-icd
```

Since we have determined that we have a compatible ICD loader installed, we can easily determine which loader is currently being used.

```
root@kali:~# clinfo | grep -i "icd loader"
  ICD loader properties
  ICD loader Name                                 OpenCL ICD Loader
  ICD loader Vendor                               OCL Icd free software
  ICD loader Version                              2.2.11
  ICD loader Profile                              OpenCL 2.1
```

As expected, our setup is using the open source loader that was installed earlier. Now, let's get some detailed information about the system.

Querying GPU Information

We'll use nvidia-smi once again, but with a much more verbose output.

```
root@kali:~# nvidia-smi -i 0 -q
Driver Version                      : 375.26
Attached GPUs                       : 1
GPU 0000:01:00.0
    Product Name                    : GeForce GTX 970
    Product Brand                   : GeForce
    Display Mode                    : Enabled
    Display Active                  : Enabled
    Persistence Mode                : Disabled
    Accounting Mode                 : Disabled
    Accounting Mode Buffer Size     : 1920
    Temperature
        GPU Current Temp            : 47 C
        GPU Shutdown Temp           : 96 C
        GPU Slowdown Temp           : 91 C
    Clocks
        Graphics                    : 1101 MHz
        SM                          : 1101 MHz
        Memory                      : 3523 MHz
        Video                       : 1012 MHz
    Processes
        Process ID                  : 692
            Type                    : G
            Name                    : /usr/lib/xorg/Xorg
            Used GPU Memory         : 198 MiB
```

It looks like our GPU is being recognized correctly, so let's use glxinfo to determine if 3D Rendering is enabled.

```
root@kali:~# glxinfo | grep -i "direct rendering"
direct rendering: Yes
```

The combination of these tools should assist the troubleshooting process greatly. If you still experience issues, we recommend searching for similar setups and any nuances that may affect your specific system.

Kali Linux VirtualBox Guest

If you run Kali Linux as a “guest” within VirtualBox, this article will help you to successfully install the “Guest Addition” tools.

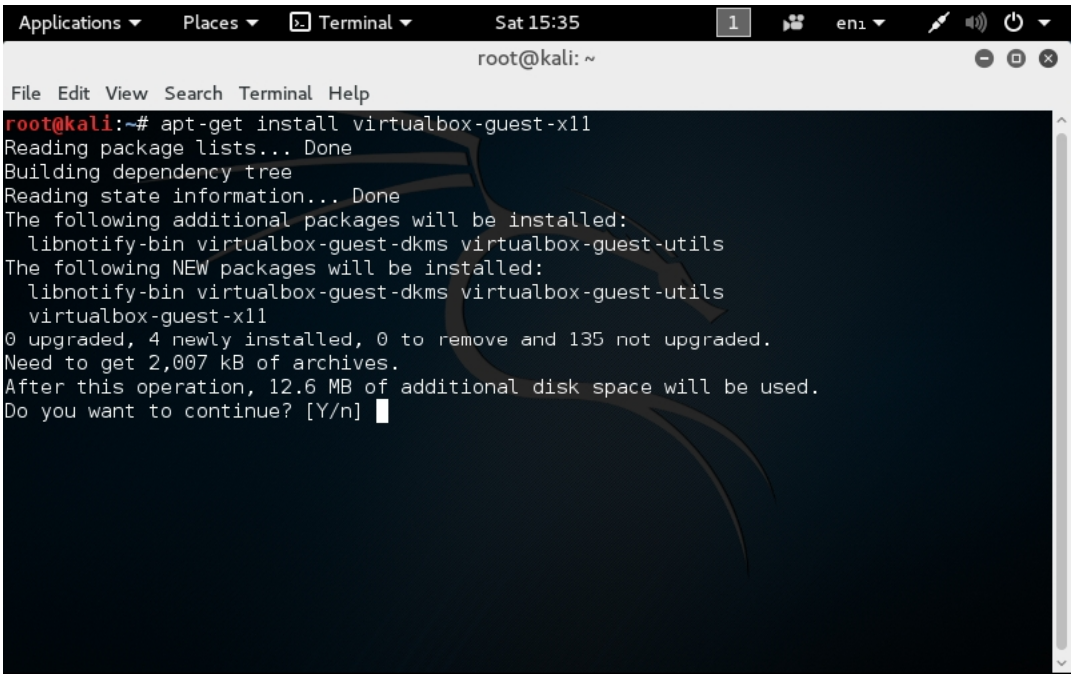
You must use version **4.2.xx or higher** of VirtualBox in order to take advantage of the improvements, including compatibility updates, and enhanced stability of both the core application and the Guest Additions.

Installing VirtualBox Guest Additions in Kali Linux

The VirtualBox Guest Additions provide proper mouse and screen integration, as well as folder sharing, with your host operating system. To install them, proceed as follows.

Start up your Kali Linux virtual machine, open a terminal window and issue the following commands.

```
apt-get update
apt-get install -y virtualbox-guest-x11
reboot
```

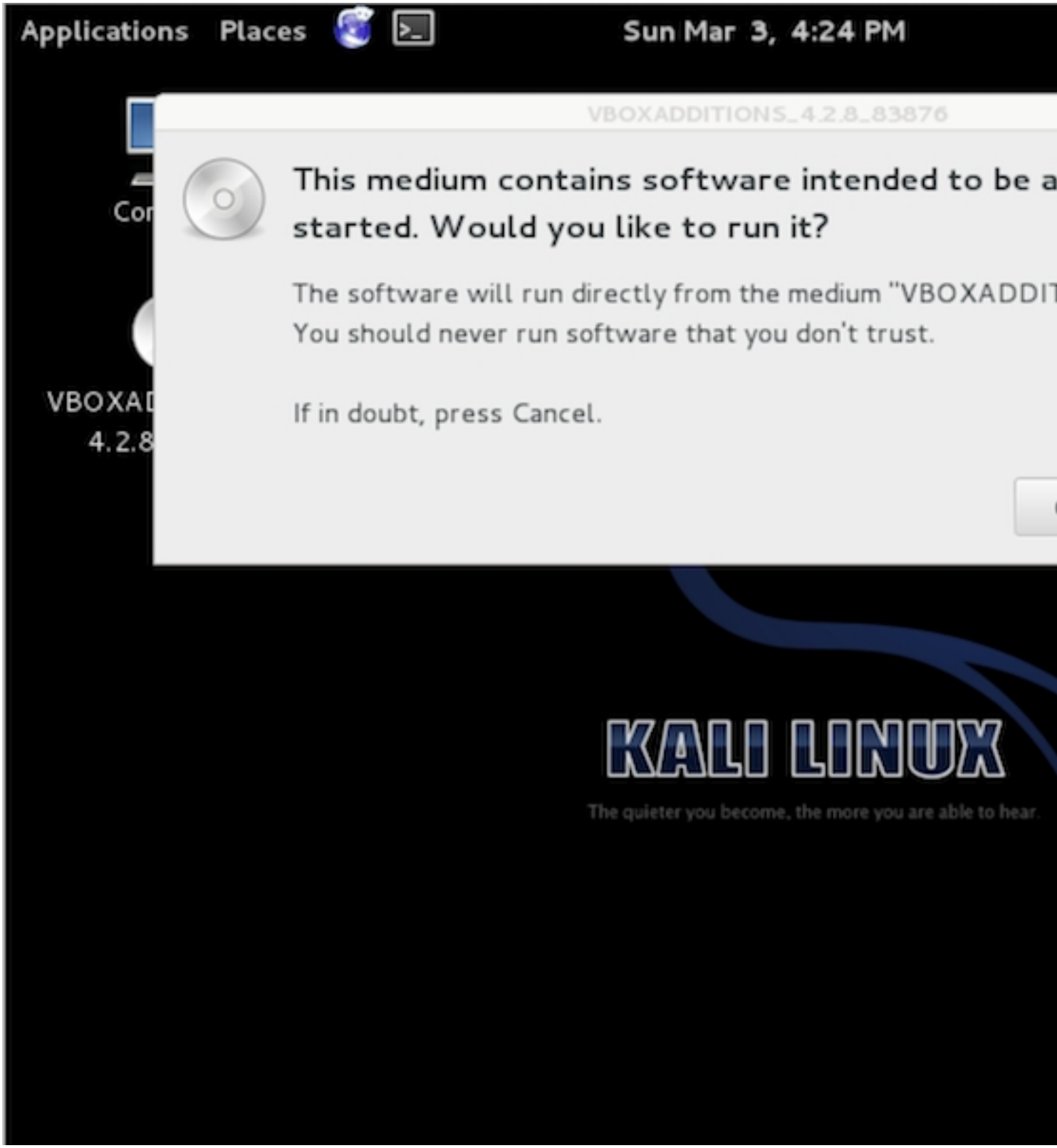

Applications
Places
Terminal
Sat 15:35
1
en1
root@kali: ~
File Edit View Search Terminal Help
root@kali:~# apt-get install virtualbox-guest-x11
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
libnotify-bin virtualbox-guest-dkms virtualbox-guest-utils
The following NEW packages will be installed:
libnotify-bin virtualbox-guest-dkms virtualbox-guest-utils
virtualbox-guest-x11
0 upgraded, 4 newly installed, 0 to remove and 135 not upgraded.
Need to get 2,007 kB of archives.
After this operation, 12.6 MB of additional disk space will be used.
Do you want to continue? [Y/n]

Installing VirtualBox Guest Additions in Older Kali Versions

Start up your Kali Linux virtual machine, open a terminal window and issue the following command to install the Linux kernel headers.

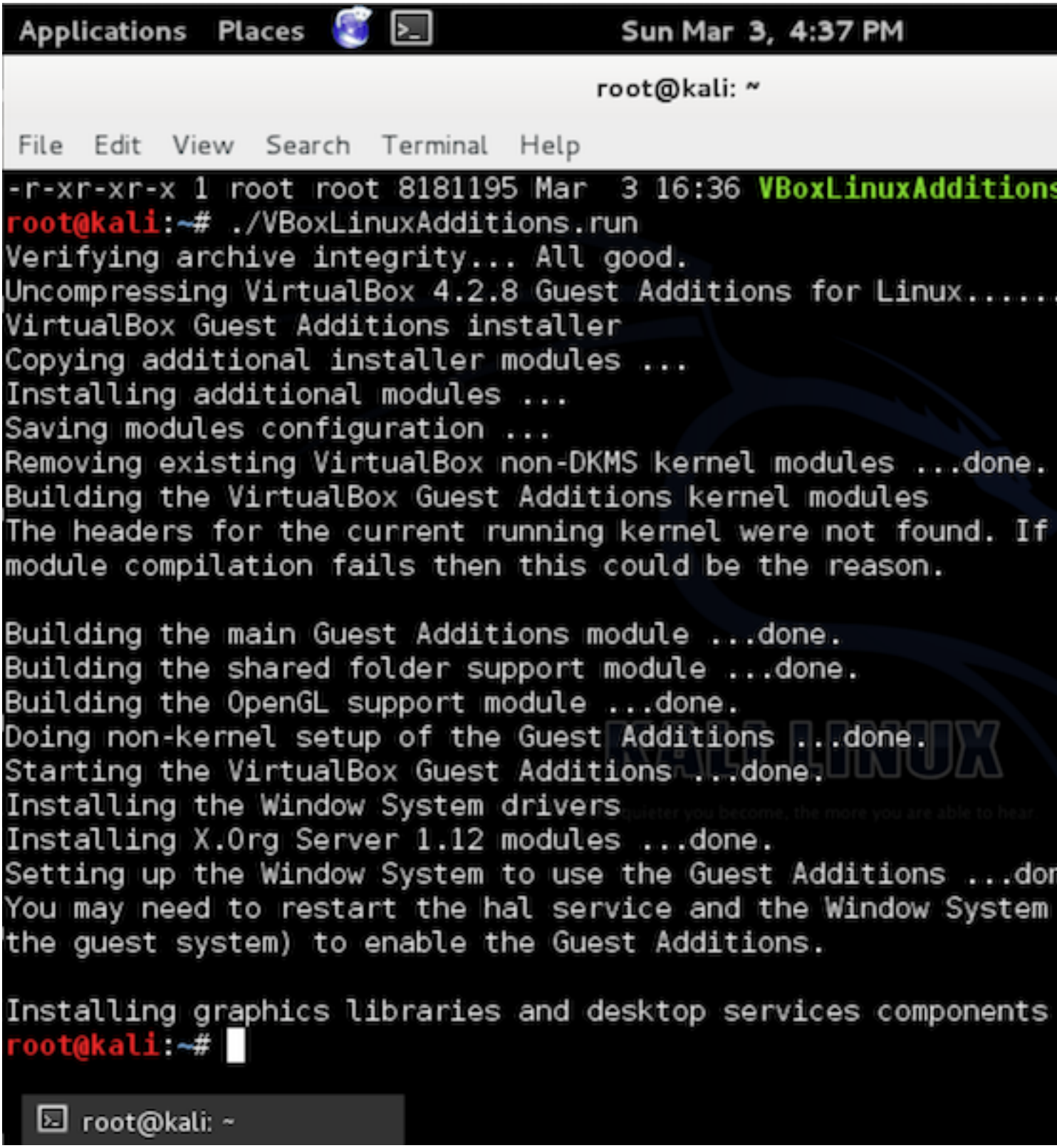
```
apt-get update && apt-get install -y linux-headers-$(uname -r)
```

Once this is complete you can now attach the “Guest Additions” CD-ROM image. Select “Devices” from the VirtualBox menu and then select “Install Guest Additions”. This will mount the Guest Additions ISO in the virtual CD drive in your Kali Linux virtual machine. When prompted to autorun the CD, click the Cancel button.


Applications
Places
Sun Mar 3, 4:24 PM
VBOXADDITIONS_4.2.8_83876
This medium contains software intended to be a
started. Would you like to run it?
The software will run directly from the medium "VBOXADDIT
You should never run software that you don't trust.
If in doubt, press Cancel.
KALI LINUX
The quieter you become, the more you are able to hear.

From a terminal window, copy the VboxLinuxAdditions.run file from the Guest Additions CD-ROM to a path on your local system. Ensure it is executable and run the file to begin the installation.

cp /media/cd-rom/VBoxLinuxAdditions.run /root/
chmod 755 /root/VBoxLinuxAdditions.run
cd /root
./VBoxLinuxAdditions.run


Applications Places Sun Mar 3, 4:37 PM
root@kali: ~
File Edit View Search Terminal Help
-r-xr-xr-x 1 root root 8181195 Mar 3 16:36 VBoxLinuxAdditions
root@kali:~# ./VBoxLinuxAdditions.run
Verifying archive integrity... All good.
Uncompressing VirtualBox 4.2.8 Guest Additions for Linux.....
VirtualBox Guest Additions installer
Copying additional installer modules ...
Installing additional modules ...
Saving modules configuration ...
Removing existing VirtualBox non-DKMS kernel modules ...done.
Building the VirtualBox Guest Additions kernel modules
The headers for the current running kernel were not found. If
module compilation fails then this could be the reason.
Building the main Guest Additions module ...done.
Building the shared folder support module ...done.
Building the OpenGL support module ...done.
Doing non-kernel setup of the Guest Additions ...done.
Starting the VirtualBox Guest Additions ...done.
Installing the Window System drivers
Installing X.Org Server 1.12 modules ...done.
Setting up the Window System to use the Guest Additions ...don
You may need to restart the hal service and the Window System
the guest system) to enable the Guest Additions.
Installing graphics libraries and desktop services components
root@kali:~#
root@kali: ~

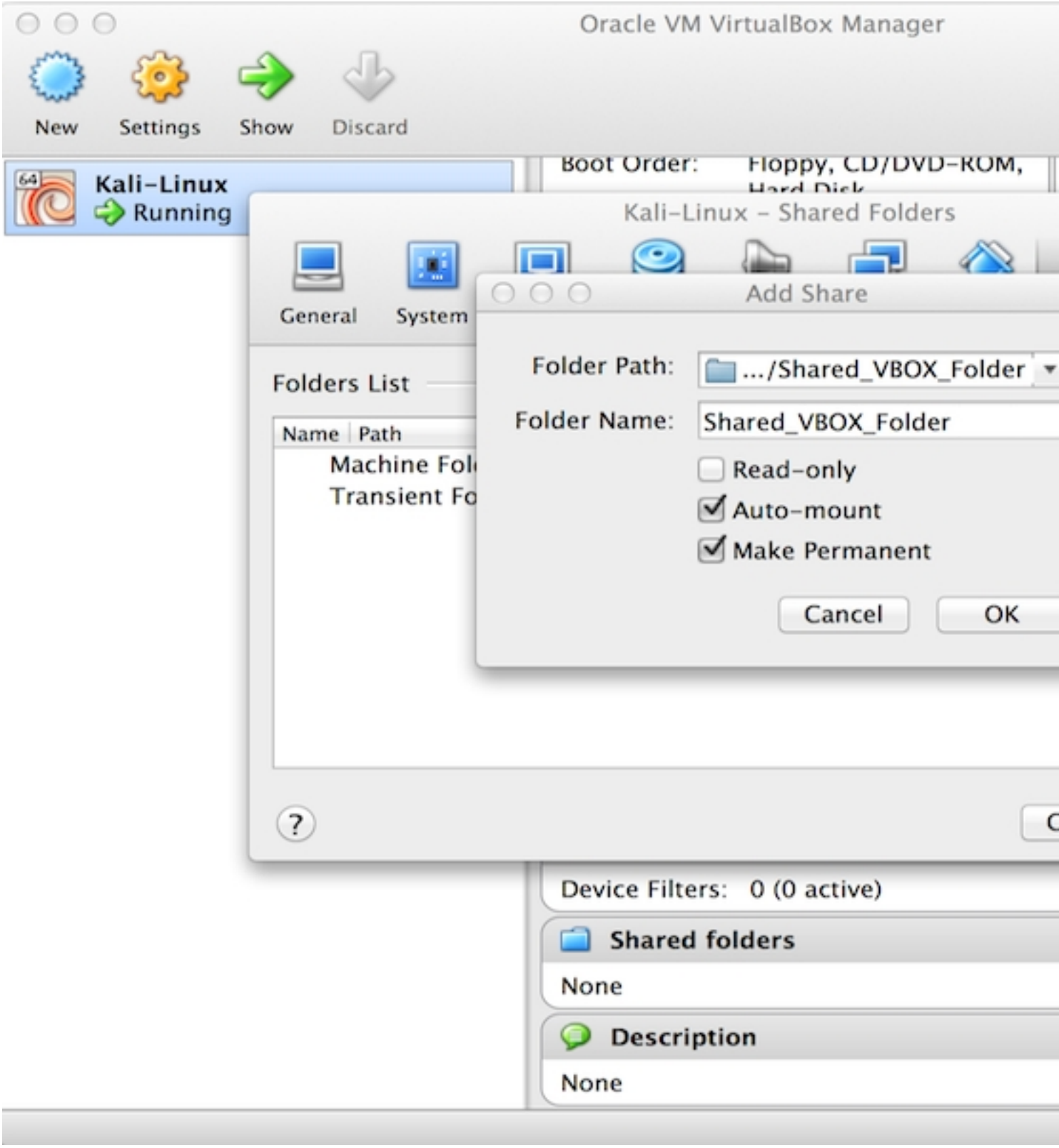
Reboot the Kali Linux VM to complete the Guest Additions installation. You should now have full mouse and screen integration as well as the ability to share folders with the host system.

Creating Shared Folders with the Host System

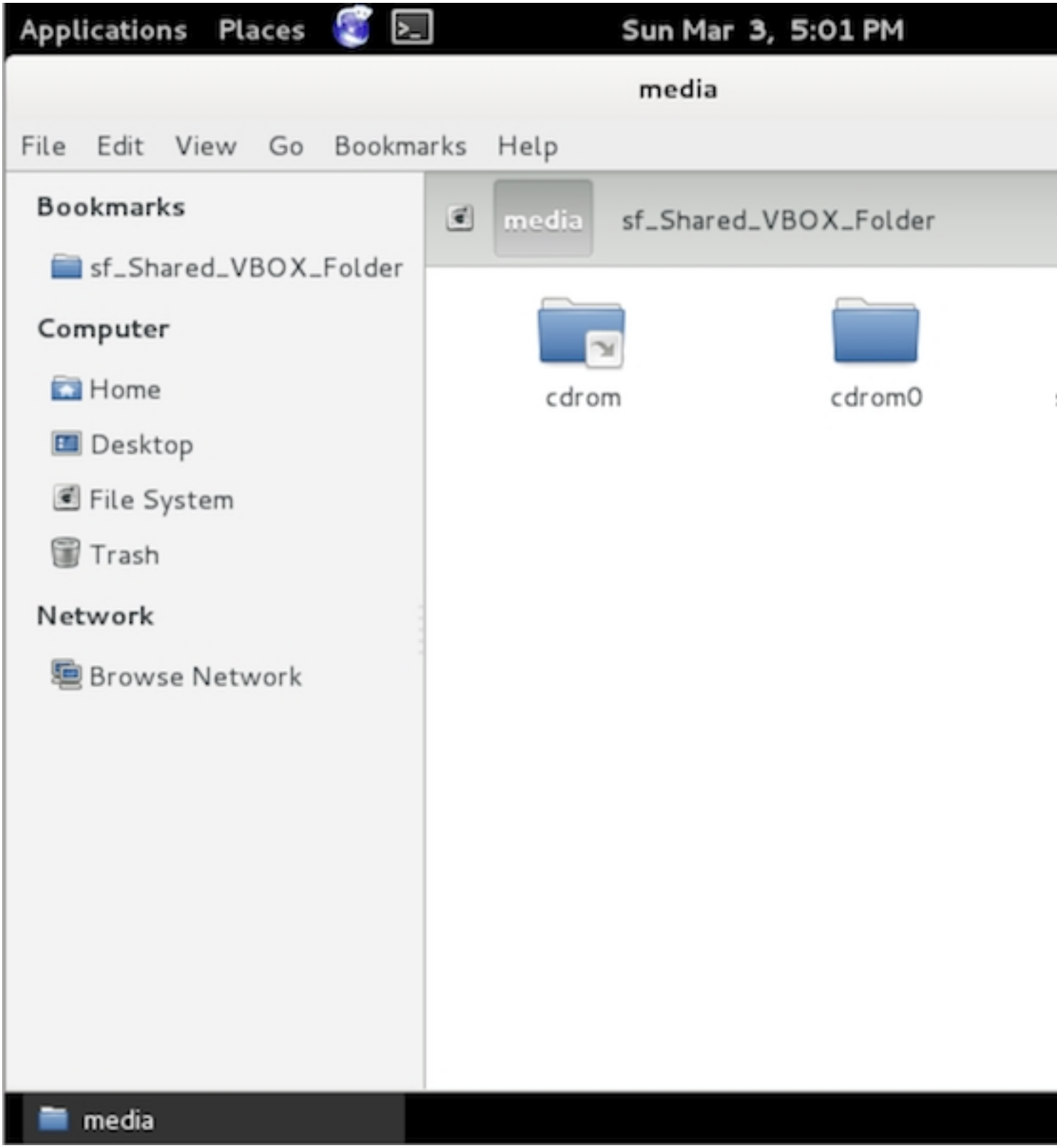
This section explains how to share folders on your host system with your Kali Linux VirtualBox “guest”.

From the VirtualBox Manager, select your Kali Linux VM instance and click on the “Shared Folders” link in the right window pane. This will launch a pop up window for adding shared folders. Within this window click the “Add Folders” icon.

In the Folder Path text box, provide the path to the folder you would like to share, or click the drop-down arrow to browse your host system for the path to the folder. Select the check boxes that allow for ‘Auto-mount’ and ‘Make Permanent’ and click the “OK” button both times when prompted.



Your shared folders will now be available in the media directory. You can create a bookmark or link for easier access to the directory.


Applications
Places
Sun Mar 3, 5:01 PM
media
File
Edit
View
Go
Bookmarks
Help
Bookmarks
sf_Shared_VBOX_Folder
Computer
Home
Desktop
File System
Trash
Network
Browse Network
media
sf_Shared_VBOX_Folder
cdrom
cdrom0
media

VMware Tools in a Kali Guest

Should you decide to create your own VMware installation of Kali Linux rather than using our pre-made VMware images, you will need to follow the instructions below in order to successfully install VMware Tools in your Kali installation.

Installing VMware Tools in Kali Linux Rolling

As of Sept 2015, **VMware recommends using the distribution-specific open-vm-tools (OVT)** instead of the VMware Tools package for guest machines. To install open-vm-tools in Kali, first make sure you are fully updated, and then enter the following:

```
apt update && apt -y full-upgrade

# Reboot now in case you have updated to a new kernel. Once rebooted:
apt -y --reinstall install open-vm-tools-desktop fuse
reboot
```

Adding Support for Shared Folders When Using OVT

Unfortunately, shared folders will not work out of the box. To enable this feature for your current session, you will need to execute the following script after logging in:

```
cat <<EOF > /usr/local/sbin/mount-shared-folders
#!/bin/bash
vmware-hgfsclient | while read folder; do
  vmwpath="/mnt/hgfs/\${folder}"
  echo "[i] Mounting \${folder}   (\${vmwpath})"
  mkdir -p "\${vmwpath}"
  umount -f "\${vmwpath}" 2>/dev/null
  vmhgfs-fuse -o allow_other -o auto_unmount ".host:/\${folder}" "\${vmwpath}"
done
sleep 2s
EOF
chmod +x /usr/local/sbin/mount-shared-folders
```

If you wish to make it a little easier, you can add a shortcut to the desktop (and allow the script to be executed upon double clicking if you are you are using GNOME):

```
ln -sf /usr/local/sbin/mount-shared-folders /root/Desktop/mount-shared-folders.sh
gsettings set org.gnome.nautilus.preferences executable-text-activation 'ask'
```

Restarting OVT

If OVT stops functioning correctly, such as Copy/Paste between host and guest, the following script may help out:

```
cat <<EOF > /usr/local/sbin/restart-vm-tools
#!/bin/bash
killall -q -w vmtoolsd
vmware-user-suid-wrapper vmtoolsd -n vmusr 2>/dev/null
vmtoolsd -b vmroot 2>/dev/null
EOF
chmod +x /usr/local/sbin/restart-vm-tools
ln -sf /usr/local/sbin/restart-vm-tools /root/Desktop/restart-vm-tools.sh
```

Installing VMware Tools in Older Kali Versions

The latest version of vmware-tools at this date compiles against our kernel, albeit with several warnings. We utilise a set of vmware-tool patches to facilitate the installation.

```
cd ~/
apt-get install git gcc make linux-headers-$(uname -r)
git clone https://github.com/rasa/vmware-tools-patches.git
cd vmware-tools-patches/
```

Next, mount the VMware tools ISO by clicking “Install VMware Tools” from the appropriate menu. Once the VMware Tools ISO has been attached to the virtual machine, copy the installer to the *downloads* directory and then run the installer script :

```
cd ~/vmware-tools-patches/
cp /media/cdrom/VMwareTools-9.9.0-2304977.tar.gz downloads/
./untar-and-patch-and-compile.sh
```

06. Customizing Kali Linux(5)

Rebuilding a Source Package

Kali Linux is easy to customize at a per-package level, and it's equally simple to make modifications to individual packages and rebuild them from their source code for inclusion in your custom ISO or on your desktop install.

Accomplishing this is a simple three-step process:

- use **apt** to pull down the package sources
- modify them as needed
- rebuild the package using the Debian tools.

In this example, we will rebuild the libfreefare package in order to add some extra hardcoded Mifare access keys into the mifare-format tool.

Downloading the Package Source

```
# Get the source package
apt update
apt-get source libfreefare
cd libfreefare-0.4.0/
```

Edit the Package Source Code

Make the changes needed to the source code of the package. In our case, we modify an example file, mifare-classic-format.c.

```
nano examples/mifare-classic-format.c
```

Check for Build Dependencies

Check for any build dependencies the package may have. These need to be installed before you can build the package.

```
dpkg-checkbuilddeps
```

The output should be similar to the following, depending on what packages you already have installed. If **dpkg-checkbuilddeps** returns no output, that means you can proceed with the build, all of the dependencies are already satisfied.

dpkg-checkbuilddeps: Unmet build dependencies: dh-autoreconf libnfc-dev libssl-dev

Install Build Dependencies

Install any build dependencies if needed, as shown in the output of **dpkg-checkbuilddeps**:

```
apt install dh-autoreconf libnfc-dev libssl-dev
```

Build the Modified Package

With all of the dependencies installed, the **dpkg-buildpackage** command is all it takes to build your new version.

```
dpkg-buildpackage
```

Install the New Package

If the build completes without errors, you'll be able to install your newly-created package with **dpkg**.

```
dpkg -i ../libfreefare*.deb
```

Live Build a Custom Kali ISO

/02. Kali Linux Live /06. Customizing Kali Linux /Live Build a Custom Kali ISO
• 02. Kali Linux Live/ 06. Customizing Kali Linux

An Introduction to Building Your Own Kali ISO

Building a customized Kali ISO is easy, fun, and rewarding. You can configure virtually any aspect of your Kali ISO build using the Debian live-build scripts. These scripts allow developers to easily build live system images by providing a framework that uses a configuration set to automate and customize all aspects of building the image. The Kali Linux development team has adopted these scripts and they're used to produce the official Kali ISO releases.

Where Should You Build Your ISO?

Ideally, you should build your custom Kali ISO from **within a pre-existing Kali environment**.

Getting Ready — Setting up the live-build system

We first need to prepare the Kali ISO build environment by installing and setting up live-build and its requirements with the following commands:

```
apt install -y curl git live-build cdebootstrap
git clone git://git.kali.org/live-build-config.git
```

Now you can simply build an updated Kali ISO by entering the “live-build-config” directory and running our **build.sh** wrapper script, as follows:

```
cd live-build-config/
./build.sh --verbose
```

The “build.sh” script will take a while to complete, as it downloads all of the required packages needed to create your ISO. Good time for a coffee.

Configuring the Kali ISO Build (Optional)

If you want to customize your Kali Linux ISO, this section will explain some of the details. Through the **kali-config** directory, the Kali Linux live build supports a wide range of customization options, which are well-documented on the Debian live build 4.x page. However, for the impatient, here are some of the highlights.

Building Kali with Different Desktop Environments

Since Kali 2.0, we now support built in configurations for various desktop environments, including KDE, Gnome, E17, I3WM, LXDE, MATE and XFCE. To build any of these, you would use syntax similar to the following:

```
# These are the different Desktop Environment build options:
#./build.sh --variant {gnome,kde,xfce,mate,e17,lxde,i3wm} --verbose

# To build a KDE ISO:
./build.sh --variant kde --verbose
# To build a MATE ISO:
./build.sh --variant mate --verbose

#...and so on.
```

Controlling the packages included in your build

The list of packages included in your build will be present in the the respective kali-$variant directory. For example, if you're building a default Gnome ISO, you would use the following package lists file – **kali-config/variant-gnome/package-lists/kali.list.chroot**. By default, this list includes the "kali-linux-full" metapackage, as well as some others. These can be commented out and replaced with a manual list of packages to include in the ISO for greater granularity.

Build hooks, binary and chroot

Live-build hooks allows us to hook scripts in various stages of the Kali ISO live build. For more detailed information about hooks and how to use them, refer to the live build manual. As an example, we recommend you check out the existing hooks in **kali-config/common/hooks/**.

Overlaying files in your build

You have the option to include additional files or scripts in your build by overlaying them on the existing filesystem, inside the **includes.{chroot,binary,installer}** directories, respectively. For example, if we wanted to include our own custom script into the **/root/**directory of the ISO (this would correspond to the "chroot" stage), then we would drop this script file in the **kali-config/common/includes.chroot/** directory before building the ISO.

Building a Kali Linux ISO for older i386 architectures

The Kali Linux i386 ISO has PAE enabled. If you require a default kernel for older hardware with PAE disabled, you will need to rebuild a Kali Linux ISO. The rebuilding process is much the same as described above, except that the **686-pae** parameter that needs to be changed to **586** in **auto/config** as follows. First, install the prerequisites.

```
apt install -y git live-build cdebootstrap debootstrap
git clone git://git.kali.org/live-build-config.git
```

Next, make the change in auto/config for the appropriate architecture:

```
cd live-build-config/
sed -i 's/686-pae/686/g' auto/config
```

Finally, run your build.

```
./build.sh --arch i386 --verbose
```

Building Kali on Non-Kali Debian Based Systems

You can easily run live-build on Debian based systems other than Kali. The instructions below have been tested to work with both Debian and Ubuntu.

First, we prep the system by ensuring it is fully updated, then proceed to download the Kali archive keyring and live-build packages.

```
sudo apt update
sudo apt upgrade
cd /root/

wget http://http.kali.org/pool/main/k/kali-archive-keyring/kali-archive-keyring_2018.1_all.deb
wget https://archive.kali.org/kali/pool/main/l/live-build/live-build_20180618kali1_all.deb
```

With that completed, we install some additional dependencies and the previously downloaded files.

```
sudo apt install -y git live-build cdebootstrap debootstrap curl
sudo dpkg -i kali-archive-keyring_2018.1_all.deb
sudo dpkg -i live-build_20180618kali1_all.deb
```

With the environment all prepared, we start the live-build process by setting up the build script and checking out the build config.

```
cd /usr/share/debootstrap/scripts/
echo "default_mirror http://http.kali.org/kali"; sed -e "s/debian-archive-keyring.gpg/kali-archive-keyring.gpg/g" sid > /tmp/kali
sudo mv /tmp/kali .
sudo ln -s kali kali-rolling

cd ~
git clone git://git.kali.org/live-build-config.git

cd live-build-config/
```

At this point, we have to edit the `build.sh` script to bypass a version check. We do this by commenting out the “exit 1” below.

```
# Check we have a good debootstrap
ver_debootstrap=$(dpkg-query -f '${Version}' -W debootstrap)
if dpkg --compare-versions "$ver_debootstrap" lt "1.0.97"; then
if ! echo "$ver_debootstrap" | grep -q kali; then
```

```
echo "ERROR: You need debootstrap >= 1.0.97 (or a Kali patched debootstrap). Your current version: $ver_debootstrap" >&2
exit 1
fi
fi
```

With that change made, the script should like as follows:

```
# Check we have a good debootstrap
ver_debootstrap=$(dpkg-query -f '${Version}' -W debootstrap)
if dpkg --compare-versions "$ver_debootstrap" lt "1.0.97"; then
if ! echo "$ver_debootstrap" | grep -q kali; then
echo "ERROR: You need debootstrap >= 1.0.97 (or a Kali patched debootstrap). Your current version: $ver_debootstrap" >&2
# exit 1
fi
fi
```

At this point, we can build our ISO as normal

```
sudo ./build.sh --variant light --verbose
```

Recompiling the Kali Linux Kernel

The customizability of Kali Linux extends all the way down into the Linux kernel.

Depending on your requirements, you might want to add drivers, patches, or kernel features that are not included in the stock Kali Linux kernel. The following guide will describe how the Kali Linux kernel can be quickly modified and recompiled for your needs. Note that global wireless injection patches are already present by default in the Kali Linux kernel.

Install Build Dependencies

Start by installing all the build dependencies for recompiling the kernel.

```
apt install build-essential libncurses5-dev fakeroot unxz
```

Download the Kali Linux Kernel Source Code

The remainder of this section focuses on the 4.9 version of the Linux kernel, but the examples can, of course, be adapted to the particular version of the kernel that you want. We assume that the linux-source-4.9 binary package has been installed. Note that we install a binary package containing the upstream sources, we do not retrieve the Kali source package named linux.

```
apt install linux-source-4.9
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  bc libreadline7
Suggested packages:
  libncurses-dev | ncurses-dev libqt4-dev
The following NEW packages will be installed:
  bc libreadline7 linux-source-4.9
0 upgraded, 3 newly installed, 0 to remove and 0 not upgraded.
Need to get 95.4 MB of archives.
After this operation, 95.8 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
[...]
ls /usr/src
linux-config-4.9  linux-patch-4.9-rt.patch.xz  linux-source-4.9.tar.xz
```

Notice that the package contains */usr/src/linux-source-4.9.tar.xz*, a compressed archive of the kernel sources. You must extract these files in a new directory (not directly under /usr/src/, since there is no need for special permissions to compile a Linux kernel). Instead, *~/kernel/* is more appropriate.

```
mkdir ~/kernel; cd ~/kernel
tar -xaf /usr/src/linux-source-4.9.tar.xz
```

Configure Your Kernel

When recompiling a more recent version of the kernel (possibly with an additional patch), the configuration will most likely be kept as close as possible to that proposed by Kali. In this case, and rather than reconfiguring everything from scratch, it is sufficient to copy the */boot/config-version* file (the version is that of the kernel currently used, which can be found with the **uname -r** command) into a *.config* file in the directory containing the kernel sources.

```
cp /boot/config-4.9.0-kali1-amd64 ~/kernel/linux-source-4.9/.config
```

If you need to make changes or if you decide to reconfigure everything from scratch, you must take the time to configure your kernel. This can be done by calling the **make menuconfig** command.

```
make menuconfig
```

The details of using **menuconfig** to set up a kernel build are beyond the scope of this guide. There is a detailed tutorial on configuring a kernel build on Linux.org.

Build the Kernel

Once the kernel configuration is ready, a simple **make deb-pkg** will generate up to 5 Debian packages: *linux-image-**version*** that contains the kernel image and the associated modules, *linux-headers-**version***, which contains the header files required to build external modules, *linux-firmware-image-**version***, which contains the firmware files needed by some drivers (this package might be missing when you build from the kernel sources provided by Debian or Kali), *linux-image-**version**-dbg*, which contains the debugging symbols for the kernel image and its modules, and *linux-libc-dev*, which contains headers relevant to some user-space libraries like GNU glibc. The Linux kernel image is a big build, expect it to take a while to complete.

```
make clean
make deb-pkg LOCALVERSION=-custom KDEB_PKGVERSION=$(make kernelversion)-1
[...]
ls ../*.deb
../linux-headers-4.9.0-kali1-custom_4.9.2-1_amd64.deb
../linux-image-4.9.0-kali1-custom_4.9.2-1_amd64.deb
../linux-image-4.9.0-kali1-custom-dbg_4.9.2-1_amd64.deb
../linux-libc-dev_4.9.2-1_amd64.deb
```

Install the Modified Kernel

When the build has successfully completed, you can go ahead and install the new custom kernel and reboot your system. Please note that the specific kernel version numbers will vary — in our example, done on a Kali 2016.2 system, it was 4.9.2. Depending on the current kernel version you're building, you will need to adjust your commands accordingly.

```
dpkg -i ../linux-image-4.9.0-kali1-custom_4.9.2-1_amd64.deb
reboot
```

Once your system has rebooted, your new kernel should be running. If things go wrong and your kernel fails to boot successfully, you can still use the GrUB menu to boot from the original stock Kali kernel and fix your issues.

ARM Cross-Compilation

The following guide will demonstrate how to set up an ARM cross-compilation environment in Kali Linux. This guide is the starting point for many of our contributed “Custom ARM Images” articles.

Setting Up Your Development Box

Compiling kernels and generating images usually comes at the cost of disk space. Make sure you have at least 50 GB of disk space available on your Kali development machine as well as ample RAM and CPU juice.

Install Dependencies

Start off by installing the required dependencies for ARM cross-compilation.

```
apt install git-core gnupg flex bison gperf libesd0-dev build-essential \
zip curl libncurses5-dev zlib1g-dev gcc-multilib g++-multilib
```

If you are running a 64 bit Kali Linux system, add i386 architecture support to your development environment as follows.

```
dpkg --add-architecture i386
apt update
apt install ia32-libs
```

Download Linaro Toolchain

Download the Linaro cross-compiler from our Git repository.

```
cd ~
mkdir -p arm-stuff/kernel/toolchains
cd arm-stuff/kernel/toolchains
git clone git://github.com/offensive-security/gcc-arm-eabi-linaro-4.6.2.git
```

Set Environment Variables

To use the Linaro cross-compiler, you will need to set the following environment variables in your session.

```
export ARCH=arm
export CROSS_COMPILE=~/arm-stuff/kernel/toolchains/gcc-arm-eabi-linaro-4.6.2/bin/arm-eabi-
```

Now your ARM cross-compilation environment is complete and you can proceed with building your own ARM kernels as described in the article on preparing a Kali Linux ARM chroot.

Preparing a Kali Linux ARM chroot

Although you can download pre-rolled Kali ARM images from our Download area, there may be applications which will require building your own custom bootstrapped Kali rootfs for ARM.

The following procedure shows an example of building a fairly generic Kali **armhf** rootfs. If you wish to build for **armel**, use that value rather than "armhf" when you export the **architecture** environment variable.

Some Notes on This Procedure

The intention in this article is more to provide a high-level overview of how the build scripts work than an actual manual procedure (although it's completely possible to walk through this example at the command line). The style mimics that used in the build scripts used to create the pre-rolled images. Specifically, you'll see a construct in several places that looks like:

```
cat << EOF > kali-$architecture/etc/apt/sources.list
deb http://http.kali.org/kali kali-rolling main non-free contrib
#deb-src http://http.kali.org/kali kali-rolling main non-free contrib
EOF
```

This simply amounts to creating a new file, **~/arm-stuff/rootfs/kali-armhf/etc/apt/sources.list**, with the contents

```
deb http://http.kali.org/kali kali-rolling main non-free contrib
#deb-src http://http.kali.org/kali kali-rolling main non-free contrib
```

Real-World Custom Kali Linux Builds for ARM Devices

Before we walk through our example, it's probably good to see how a custom ARM build would actually be accomplished. Typically, to do a local build of an image for, e.g., Raspberry Pi, the process would be something like the following. As an initial one-time set-up, clone the ARM build scripts repository on GitHub and install the build prerequisites:

```
cd ~
git clone https://github.com/offensive-security/kali-arm-build-scripts.git
dpkg --add-architecture i386
apt update
apt -y install debootstrap qemu-user-static device-tree-compiler lzma lzop u-boot-tools libncurses5:i386 pixz
```

To do an ARM build, you must enable cross-compilation for your current shell session:

```
export ARCH=arm
mkdir -p arm-stuff/kernel/toolchains
cd arm-stuff/kernel/toolchains
git clone git://github.com/offensive-security/gcc-arm-eabi-linaro-4.6.2.git
export CROSS_COMPILE=~/arm-stuff/kernel/toolchains/gcc-arm-eabi-linaro-4.6.2/bin/arm-eabi-
```

Then simply invoke the build script for the specific platform. So, for a Raspberry Pi build of Kali Linux 2016.2, execute the commands:

```
cd ~
kali-arm-build-scripts/rpi.sh 2016.2
```

The ARM build scripts are all completely self-contained, aside from the initial one-time installation of the build prerequisites. The first time you run one of the ARM build scripts, it is *extremely important* that you inspect the output for any errors such as missing tools, etc., correct them, and then re-run the script until you get a clean build. Only at that point can you go ahead to make any customizations you want to the basic build script to create the specific "recipe" you're after.

It's possible to speed up your builds by caching the packages you download using **apt-cacher-ng**, as described in the previous article. Note that this can break some of the standard build scripts unless you uncomment certain lines before building — they're noted in the scripts themselves. If you're using **apt-cacher-ng**, make sure you *check your scripts* for any necessary changes.

For reliable and predictable results, build your Kali Linix ARM chroot **from within a pre-existing and up-to-date Kali Linux environment**. This guide assumes that you have already set up your ARM cross-compilation environment.

An Annotated Example of a Generic ARM Build of Kali Linux

The build described here is both minimal and generic. A small number of basic packages are included, and the fuller configuration needed for a real-world platform is omitted for the sake of clarity. Use this example as a reference for understanding what's going on in the official ARM build scripts and as a high-level guide for writing your own build scripts. It can be successfully followed as a stand-alone tutorial from the command line, but the image produced is not likely to run on any particular device. Use the pre-rolled build scripts, either as-is or with your own customizations, to produce working images for concrete hardware.

Install Required Tools and Dependencies

This is a general set-up task, and should only ever need to be done once.

```
apt install debootstrap qemu-user-static
```

Enable Cross-Compilation

In order to enable the Linaro cross-compilation, you will need to set these environment variable at the beginning of every session.

```
export ARCH=arm
export CROSS_COMPILE=~/arm-stuff/kernel/toolchains/gcc-arm-eabi-linaro-4.6.2/bin/arm-eabi-
```

Define Architecture and Custom Packages

This is where you define some environment variables for your required ARM architecture (armel vs armhf) and list the packages to be installed in your image. These will be used throughout this article, so make sure to modify them to your needs.

```
export packages="xfce4 kali-menu wpasupplicant kali-defaults initramfs-tools u-boot-tools nmap openssh-server"
export architecture="armhf"
```

Build the Kali rootfs

Set Up the Base rootfs

As our starting point, we'll create a standard directory structure and use **debootstrap** to install a base ARM rootfs from the Kali Linux repositories. We then copy over **qemu-arm-static**, an ARM emulator, from our host machine into the rootfs in order to initiate the 2nd stage chroot.

```
cd ~
mkdir -p arm-stuff # should have already been created when setting up x-compilation
cd arm-stuff/
mkdir -p kernel # should have already been created when setting up x-compilation
mkdir -p rootfs
cd rootfs

debootstrap --foreign --arch $architecture kali-rolling kali-$architecture http://http.kali.org/kali
cp /usr/bin/qemu-arm-static kali-$architecture/usr/bin/
```

2nd Stage chroot

First, we'll chroot into our newly-created base rootfs, use **debootstrap** a second time to construct our second-stage rootfs, and configure base image settings such as repositories (in **/etc/apt/sources.list**), host name (in **/etc/hostname**), default network interfaces and behavior (in **/etc/network/interfaces** and **/etc/resolv.conf**), etc. Change these to suit your requirements.

```
cd ~/arm-stuff/rootfs
LANG=C chroot kali-$architecture /debootstrap/debootstrap --second-stage

cat << EOF > kali-$architecture/etc/apt/sources.list
deb http://http.kali.org/kali kali-rolling main non-free contrib
# deb-src http://http.kali.org/kali kali-rolling main non-free contrib
EOF

echo "kali" > kali-$architecture/etc/hostname

cat << EOF > kali-$architecture/etc/network/interfaces
auto lo
iface lo inet loopback
auto eth0
```

```
iface eth0 inet dhcp
EOF

cat << EOF > kali-$architecture/etc/resolv.conf
nameserver 8.8.8.8
EOF
```

Now, we're ready to assemble our third-stage chroot.

3rd Stage chroot

This is where your specific customizations come in. Your **$packages** list is installed, as are keymaps, a default root password of "toor" is set, and other configuration changes and fixes are applied.

```
export MALLOC_CHECK_=0 # workaround for LP: #520465
export LC_ALL=C
export DEBIAN_FRONTEND=noninteractive

mount -t proc proc kali-$architecture/proc
mount -o bind /dev/ kali-$architecture/dev/
mount -o bind /dev/pts kali-$architecture/dev/pts

cat << EOF > kali-$architecture/debconf.set
console-common console-data/keymap/policy select Select keymap from full list
console-common console-data/keymap/full select en-latin1-nodeadkeys
EOF
```

Here, we'll create the script to do the third-stage chroot

```
cat << EOF > kali-$architecture/third-stage
#!/bin/bash
dpkg-divert --add --local --divert /usr/sbin/invoke-rc.d.chroot --rename /usr/sbin/invoke-rc.d
cp /bin/true /usr/sbin/invoke-rc.d

apt update
apt install locales-all
#locale-gen en_US.UTF-8

debconf-set-selections /debconf.set
rm -f /debconf.set
```

```
apt update
apt -y install git-core binutils ca-certificates initramfs-tools u-boot-tools
apt -y install locales console-common less nano git
echo "root:toor" | chpasswd
sed -i -e 's/KERNEL\!="eth\*|/KERNEL\!="/' /lib/udev/rules.d/75-persistent-net-generator.rules
rm -f /etc/udev/rules.d/70-persistent-net.rules
apt-get --yes --force-yes install $packages

rm -f /usr/sbin/invoke-rc.d
dpkg-divert --remove --rename /usr/sbin/invoke-rc.d

rm -f /third-stage
EOF
```

Now, we'll run it from within our second-stage chroot.

```
chmod +x kali-$architecture/third-stage
LANG=C chroot kali-$architecture /third-stage
```

Manual Configuration Within the chroot

If you need to make any further modifications in your rootfs environment, you can do so by manually chrooting into it with the following command and making any needed changes.

```
LANG=C chroot kali-$architecture
```

Once you've completed your modifications, leave the chroot'ed rootfs with the command

```
exit
```

Cleanup

Lastly, we create and run a cleanup script in our chroot to free up space used by cached files and run any other cleanup jobs we may require, and unmount the directories we were using in our rootfs.

```
cat << EOF > kali-$architecture/cleanup
#!/bin/bash
rm -rf /root/.bash_history
apt update
apt clean
rm -f cleanup
```

```
EOF

chmod +x kali-$architecture/cleanup
LANG=C chroot kali-$architecture /cleanup

umount kali-$architecture/proc
umount kali-$architecture/dev/pts
umount kali-$architecture/dev/

cd ..
```

Congratulations! Your custom Kali ARM rootfs is located in the **~/arm-stuff/rootfs/kali-$architecture** directory. You can now tar up this directory or convert it to an image file for further work.

07. Kali Community Support(5)

Submitting Bugs for Kali Linux

/07. Kali Community Support /Submitting Bugs for Kali Linux
• 07. Kali Community Support

Introduction

This article is a guide for putting together a bug report so that it gets addressed as quickly as possible.

First, Kali Linux is a labor of love, born out of a desire to give back to the community, a community that we're a part of. In our development roles, it's our goal to continually improve and evolve the project, making things better for the entire community of Kali Linux users. The developers who provide support to you are volunteers doing so out of altruism. Kali Linux is their gift to you. Please keep this in mind when making your comments.

Second, the goal of a successful bug report is to enable the Kali Linux developers to reproduce the issue and see the failure, if any. If the Kali development team can reproduce the reported failure, they can proceed to gather extra information until the root cause is determined. If the failure can't be reproduced, the development team will request additional information until they can reproduce the results reported by the submitter.

Please note, submissions are best read by our team in **English**.

Help us help you! To give us the best start in getting your issue resolved:

- Supply all the information you can. Try to stick to what's relevant, but if you're uncertain, too much is better than too little.
- Keep your bug report objective and try to stick to the facts at hand.
- Be very clear about what *is* a fact — document these whenever possible, via logs, scrollback captures, etc. — and what is a hypothesis on your part.
- Do not quote Wikipedia and other non-primary resources as "facts" in your submission. What's happening on your system is what's at issue, not what Wikipedia claims
- Do not stack multiple issues into a single report; submit additional reports as needed. One person should submit one report, for one bug, on one particular hardware combination. Trying to stack multiple variations into a single report makes any specific issue in there very difficult to tease out. What seem like similar bugs to you may in fact turn out to be unrelated.
- If one of the developers asks for additional information, please do your best to understand what's being asked for and provide it in a reasonable time. If you're not sure you understand what you're being asked for, ask for clarification, we'll do our best to provide more guidance. Do not post comments that are unhelpful such as "Me too!" or "+1".
- Do not complain about how long it takes to fix a bug. Remember: the developers are volunteers with day jobs, which are not fixing your bugs for you.

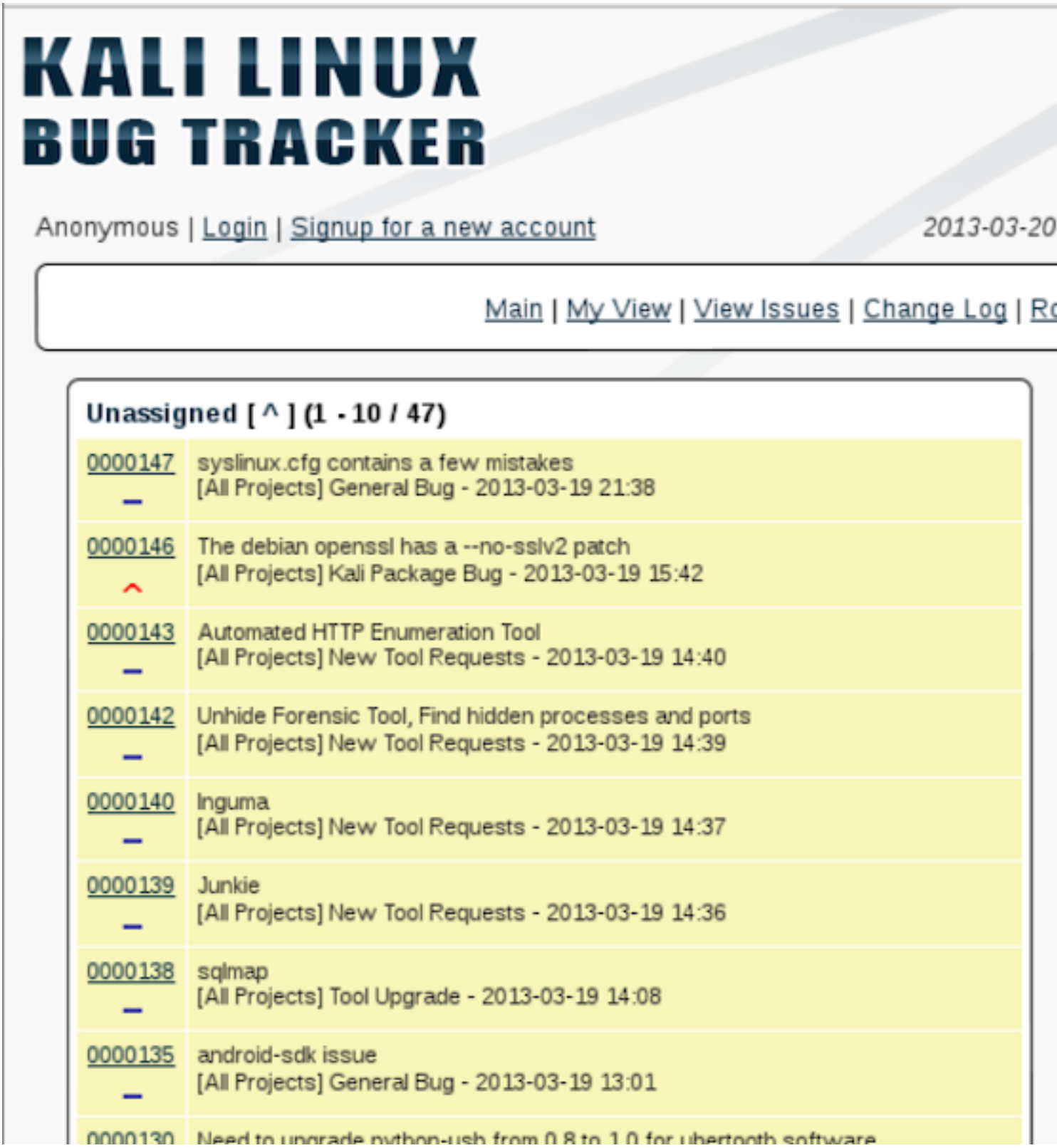
How to Report a Bug

The Kali Linux Bug Tracker can be found at https://bugs.kali.org. This section will guide you through signing up for a new account, creating a system profile, and creating a detailed bug report for submission to the Bug Tracker.

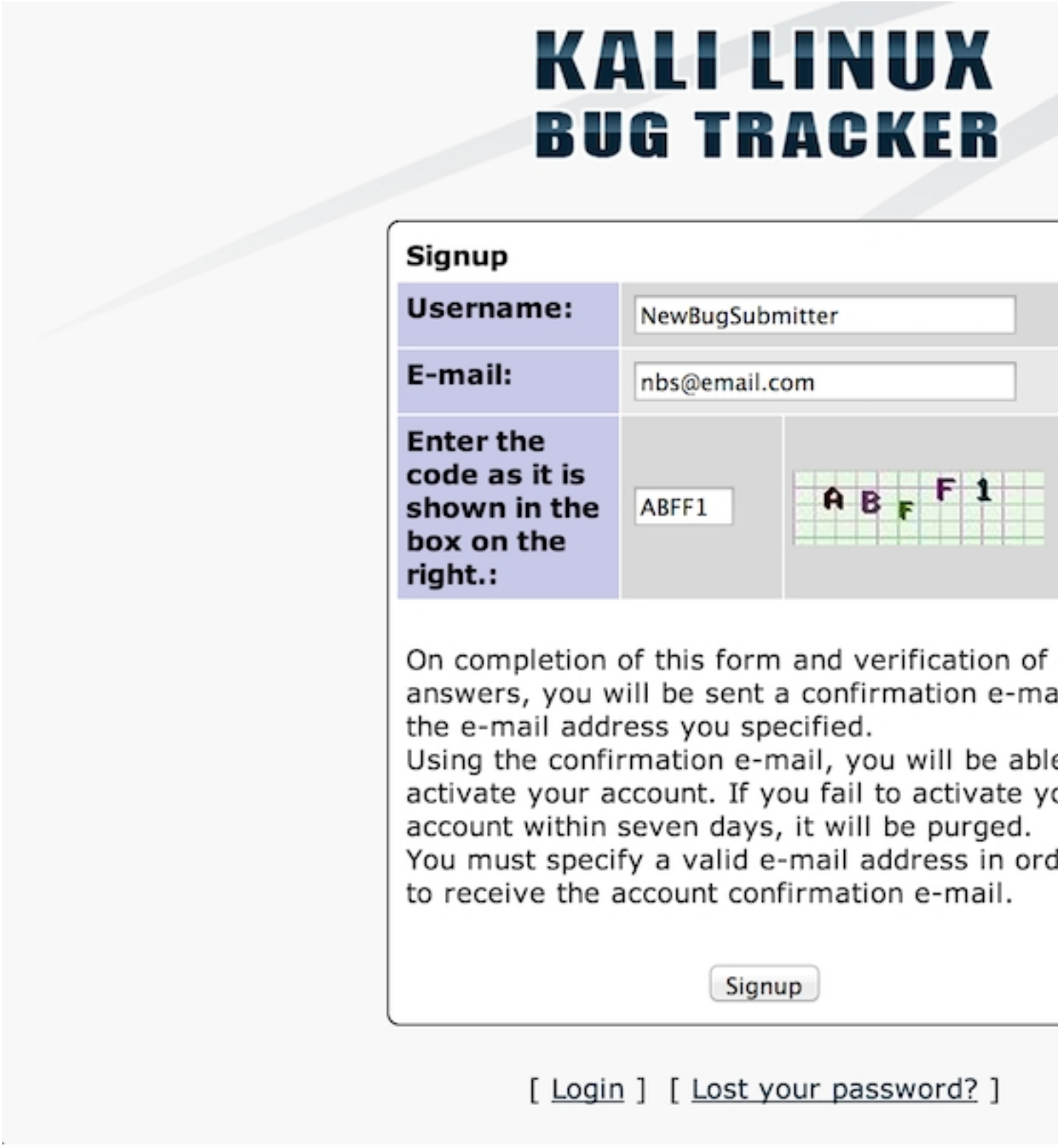
Signing Up For a Bug Tracker Account

You'll have to create an account before the Bug Tracker will allow you to submit reports or comment on existing ones.

On the bug tracker website, click **Signup for new account**.


KALI LINUX
BUG TRACKER
Anonymous | Login | Signup for a new account
2013-03-20
Main | My View | View Issues | Change Log | Ro
Unassigned [^] (1 - 10 / 47)
0000147
syslinux.cfg contains a few mistakes
[All Projects] General Bug - 2013-03-19 21:38
0000146
The debian openssl has a --no-sslv2 patch
[All Projects] Kali Package Bug - 2013-03-19 15:42
0000143
Automated HTTP Enumeration Tool
[All Projects] New Tool Requests - 2013-03-19 14:40
0000142
Unhide Forensic Tool, Find hidden processes and ports
[All Projects] New Tool Requests - 2013-03-19 14:39
0000140
Inguma
[All Projects] New Tool Requests - 2013-03-19 14:37
0000139
Junkie
[All Projects] New Tool Requests - 2013-03-19 14:36
0000138
sqlmap
[All Projects] Tool Upgrade - 2013-03-19 14:08
0000135
android-sdk issue
[All Projects] General Bug - 2013-03-19 13:01

Provide a username, e-mail address, and respond to the CAPTCHA challenge. Click the **Signup** button to proceed.


KALI LINUX
BUG TRACKER
Signup
Username:
NewBugSubmitter
E-mail:
nbs@email.com
Enter the code as it is shown in the box on the right.:
ABFF1
On completion of this form and verification of
answers, you will be sent a confirmation e-ma
the e-mail address you specified.
Using the confirmation e-mail, you will be able
activate your account. If you fail to activate yo
account within seven days, it will be purged.
You must specify a valid e-mail address in ord
to receive the account confirmation e-mail.
Signup
[Login] [Lost your password?]

If successful, the next page will notify you that the account registration has been processed and the bug tracker system will send a confirmation email to the address you provided. You will need to visit the link in the email in order to activate your account.

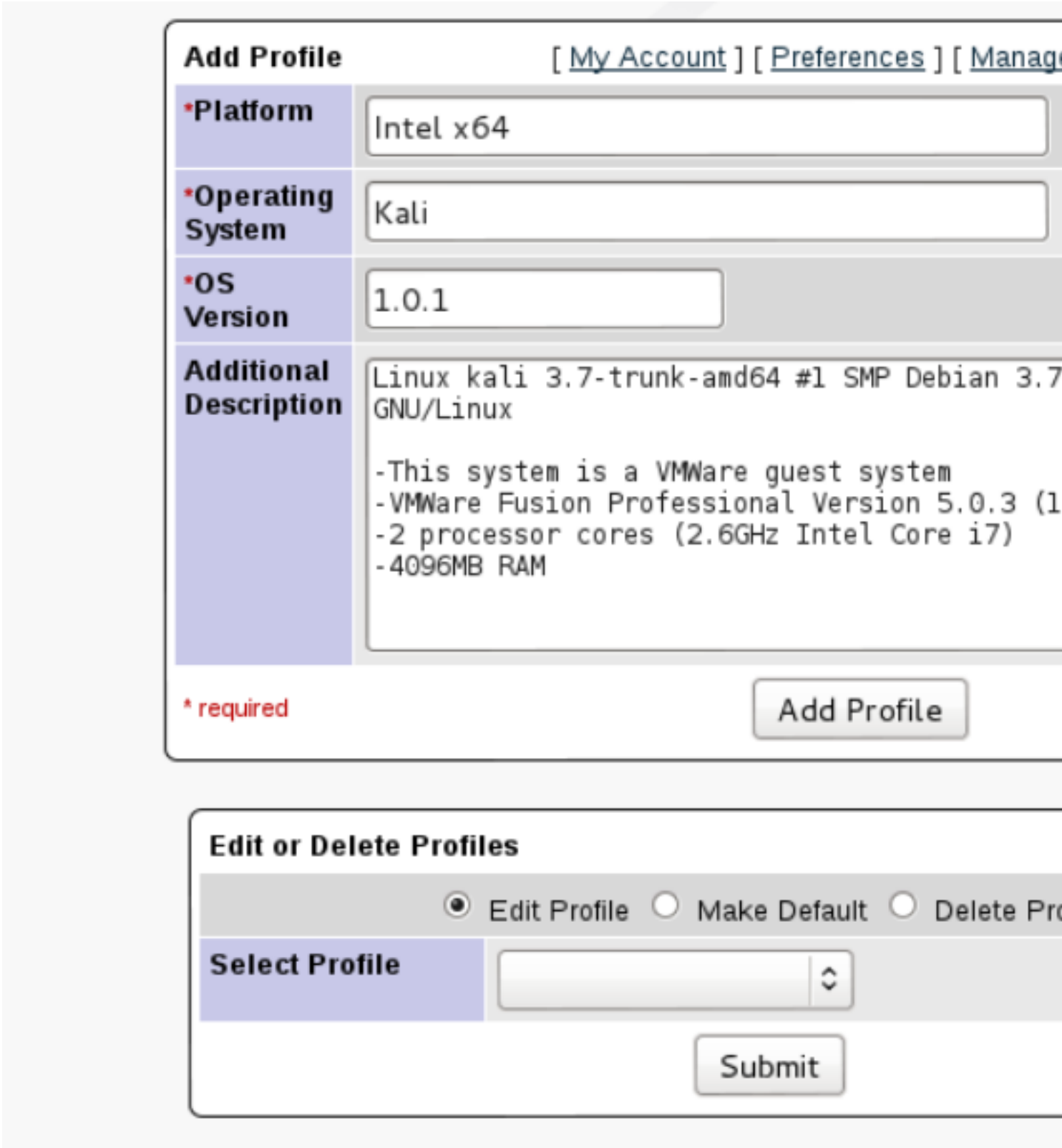
Once your account has been activated, click **Proceed** to continue to the Bug Tracker login page.

KALI LINU
BUG TRACK
Account registration proce
Congratulations. You have registered
You are now being sent a confirmation
verify your e-mail address. Visiting th
you in this e-mail will activate your a
You will have seven days to complete
confirmation process; if you fail to co
account confirmation within seven day
registered account may be purged.
[Proceed]

Creating a Profile in the Kali Linux Bug Tracker

Although not required, we recommend you create a unique profile as part of your Bug Tracker account. Profiles are shortcuts that predefine values for your CPU platform, operating system and version, as well as allowing you to provide some additional information, all of which is automatically submitted as part of your bug report. You can create a custom profile for each Kali system you're using or select from the default profiles provided.

To create or edit a custom profile, select **My Account** from the main page and then select **Profiles**. Add the specific information and description for your system and click the **Add Profile** button when done.



Once the profile has been added, it will appear in the **Select Profile** drop-down list when you report a new issue. Create as many different profiles as you need, just be sure to select the appropriate one when submitting your bug report, or a lot of confusion may result.

Be Sure You Are Not Duplicating a Previous Report

Before starting your report, search the site for keywords related to your issue. If there is already an existing bug not related to hardware, please do not duplicate the request or add notes that provide no new information or are otherwise unnecessary (e.g. “Me Too” or “+1”). If the bug has already been reported, you can view the status of any progress toward resolving the issue by clicking the ID link.

However, if you believe the issue to be hardware related, please submit a new report with your *specific* information, even if it appears similar. There is a strong chance that your hardware does not exactly match that of another reporter. Do not assume that just because you have the same desktop or laptop model that your issue is not unique.

Creating the Report

To begin your report, log into your account and click the **Report Issue** link on the landing page. You will need to provide as much information as you possibly can. If unsure, review the pointers at the beginning of this document.

The following fields are *mandatory* within the report:

- Category
- Summary
- Description

Even though the other fields are not mandatory, we recommend you try to include as much information as possible within each option while paying special attention to the following fields:

- Reproducibility — How reproducible is this bug? Always? Only sometimes? Only under specific circumstances?
- Select Profile — We need to know what you’re running, and what you’re running it *on.*
- Steps to Reproduce — Be very clear here, and provide as much concrete detail as you can.
- Additional Information
- Upload File (error logs, screenshot)

Decide the Proper Category

There are currently four (4) categories available in the Kali bug tracker. Before you begin your request, ensure it is properly designated for one of the following:

- General Bug
- Kali Package Bug
- New Tool Requests
- Tool Upgrade

Do not request support or ask questions within the bug tracker. Kali Linux offers several options for support including http://docs.kali.org , https://forums.kali.org, and our IRC chat room (***#kali-linux*** on freenode)

Providing a Descriptive Summary

The summary field is essentially the 'title' of the bug report and it will be the first thing Kali developers and other visitors see. Provide a short, yet descriptive, summary that describes the issue or request.

A good summary: Chromium Package installed from repo will not run as root user

A bad summary: Chromium doesn't work

The summary does not need to include everything, but it should convey your reason for submitting the report.

Using dpkg to Find the Package and Version for the Report

You can find which package is installed using a combination of dpkg flags. It is important to include relevant information from the output of these commands in your report. The output can also be placed in a text file and uploaded. (Discussed later within this document.)

- dpkg –search
- dpkg –list
- dpkg –status

Sample Output

```
root@kali:~# which chromium
/usr/bin/chromium
root@kali:~# type chromium
chromium is /usr/bin/chromium
root@kali:~# dpkg --search /usr/bin/chromium
chromium: /usr/bin/chromium
root@kali:~# dpkg --list chromium
Desired=Unknown/Install/Remove/Purge/Hold
| Status=Not/Inst/Conf-files/Unpacked/halF-conf/Half-inst/trig-aWait/Trig-pend
|/ Err?=(none)/Reinst-required (Status,Err: uppercase=bad)
||/ Name           Version      Architecture Description
+++-==============-============-============-
=================================
ii  chromium       55.0.2883.75-3 amd64        Google open source chromium web
root@kali:~# dpkg --status chromium
Package: chromium
Status: install ok installed
Priority: optional
Section: web
Installed-Size: 160895
Maintainer: Debian Chromium Maintainers <pkg-chromium-maint@lists.alioth.debian.org>
Architecture: amd64
Source: chromium-browser
Version: 55.0.2883.75-3
…Output Truncated…
```

Building the Description Scenario

This is your opportunity to to help us out and provide a well thought-out description of the problem you're experiencing. Please provide as many details and facts as possible.

Please ensure you include the following where applicable:

- *Exact and complete text* of any error messages (screen output or log files)
- *Exactly* what you typed or what actions you took to produce the issue
- A suggested fix, workaround, or patch if you are able to produce one
- The version of the package having the problem, and any information relating to dependent packages

- The kernel version, shared C library, and any other details that seem appropriate
- The output of the command `uname –a`
- The output of the command `dpkg -s libc6 | grep ^Version`
- If applicable, software version — (i.e. `python –V`, etc.)
- Details of your hardware
- If you are reporting an issue with a device driver, please provide full details on all hardware in your system — for a complete report on your system install `lshw` from the repos.
- Add any other details that seems relevant
- Do not worry about the report being “too long” — as long as the information is relevant, include it.

Here’s an example of a good bug report, providing information that the development team can immediately use to reproduce and try to understand the bug:

Package: Chromium

Architecture: amd64

Maintainer: Debian Chromium Maintainers

Source: chromium-browser

Version: 55.0.2883.75-3

I installed the chromium web browser from the Kali Linux repos, using the command ‘apt install chromium’. I launched the program from the Kali menu by selecting Applications/Internet/Chromium Web Browser. Chromium did not launch as expected, instead it provided an error pop-up window.

The error message stated, “Chromium cannot be run as root. Please start Chromium as a normal user. To run as root, you must specify an alternate –user-data-dir for storage of profile information”.

I clicked the Close button to close the pop up window.

uname –a output: Linux kali 4.7.0-kali1-amd64 #1 SMP Debian 4.7.6-1kali1 (2016-10-17) x86_64 GNU/Linux

C Library Version: 2.24-8

The Importance of Reproducibility

The Kali Linux bug tracker allows you to provide the frequency of the issue being reported. If you are submitting a request for a new tool or an upgrade to an existing tool, simply select **N/A** from the drop down options. If submitting a bug, please provide the appropriate response.

Continuing the example above, by design, Chromium will not launch as root, so you would select ‘always’ from the drop-down menu.

It is extremely important you provide an accurate response. If the Kali developers attempt to reproduce the issue, they need to know the frequency. If the issue happens occasionally but you have marked ‘always’, the issue may be closed prematurely as the developer doing the testing may not experience the issue.

Selecting the Proper Profile

As discussed above, using a custom-defined profile is best for each issue reported. If custom profiles are not created, select the appropriate “standard” profile from the drop-down menu. At the time of this writing, the following options are available.

- armel Kali 1.0
- armhf Kali 1.0
- x64 Kali 1.0
- x86 Kali 1.0

Providing Steps to Reproduce the Issue

Although this may seem redundant when compared with the description section, this section should *only* include the steps taken to reproduce the issue. Some steps may seem unnecessary, but it is important to ensure you document the process as well as you can. The missing step may be the one that’s key to reproducing the issue.

Here’s an example of a good set of steps for reproducing our example Chromium bug.

---

1. Opened a terminal window by selecting Applications/Accessories/Terminal
2. Typed ‘apt install chromium’ in the terminal and hit enter to run the command
3. Attempted to run Chromium web browser by selecting Applications/Internet/Chromium Web Browser

---

Providing Additional Information

In this section, you can provide any additional information you believe is relevant to the issue. If you have a fix or workaround for the issue, please provide it in this section. Again, it is important to stick to the facts and document the steps clearly so the developers can reproduce the issue.

An example of some useful “Additional Information”:

There is a simple fix that is well documented on several forums. I tried it and it fixed the issue for me.

- Using a text editor open /etc/chromium/default
- Add –user-data-dir flag
- i.e. CHROMIUM_FLAGS=”–user-data-dir”

Can this be patched within the repo version of Chromium so adding this flag is not required for future releases?

Uploading Relevant Files

Sometimes it is important to provide information to the development team that can’t easily be typed in as text. This section of the report allows you to add screenshots and log files. Be mindful of the size limitation in place.

You can add a file by clicking the ‘Choose File’ button. This will open the file manager for your system and allow you to select the file you want to attach to your report. Once you have selected the file, click the ‘Open’ button to return to your report and click the ‘Upload File’ button.

Submitting the Report

At this point, you are ready to submit the report. All that is left to do is click the ‘Submit Report’ button. Your report will be submitted and assigned a tracking ID. The report will show up on your ‘My View’ page under ‘Reported by Me’. This will allow you to track the issue to resolution.

Summary

Bug reports help the Kali Linux development team see the failure with their own eyes. Since they cannot be with you to experience the problem you’re having, you must provide instructions detailed enough that they can make their own systems fail themselves.

Describe everything in detail, stating the steps taken, what you saw, what you did, as well as the expected outcome.

Attempt to find an issue or fix through research, if at all possible — remember, open source development is a participatory process! If you are able to provide a solution to fix the issue for your system, provide the developers with the same level of detail as you did when reporting the bug. It is important that the developers know *exactly* what you did, so they can successfully repeat the process. This should not stop you from filing a full explanation of the symptom that caused the unexpected behavior.

Write accurately, be clear, precise, and concise to ensure the developers cannot misinterpret what you are trying to convey.

Be prepared to provide additional information; the developers will not ask if they don’t need the information.

Please be patient with your request, the developers want to fix your issue as much as you do. We love what we do and are proud to continue making Kali Linux the most advanced penetration testing distribution ever, and grateful for the assistance we get from you, our community of users, in doing so.

Kali Linux Community Forums

/07. Kali Community Support /Kali Linux Community Forums
• 07. Kali Community Support

The official community forums for the Kali Linux project are located at forums.kali.org.

It's our goal that everyone feel welcome in the Kali Linux community, and to ensure that everyone understands the expectations, we have outlined some simple rules below. Please take a few moments to review them before joining the forums.

Forum Rules

By registering with our forums you agree to be bound by the following rules.

- We do not condone any illegal activity at all.
- Any advice or information offered in the forums is to be used for legal informational, professional, or educational purposes.
- New registrants' posts will be moderated at first, causing a slight delay in the post appearing – please ***do not*** report problems with your post not appearing instantly during your first three days of membership.
- Please use sensible and descriptive titles for your posts – titles like "Please Help Me!!" or "Need Assistance" or "What Am I Doing Wrong?" etc., don't give forum members any idea what the issue might be and are unlikely to draw either interest or assistance.
- Do *not* cross-post across sub-forums, please – one post in the relevant area is enough!
- Before creating a new thread, please search the forums for similar or related previous postings. If you *do* create a new thread asking a question that has already been asked, don't be surprised if your thread gets deleted without notice.
- ***Do not post*** about breaking into networks that do not belong to you and for which you have no permissions. ***Do not post*** about illegal activities.
- Religious, political, or pornographic references will *not* be tolerated. Stay on topic.
- Posts about your success in "hacking" into your neighbours WiFi or queries about how to break into a network, etc., are not welcome and will vanish (quite possibly along with your user ID).
- Spam messages they will be summarily removed, and you will be summarily banned if you posted them.
- Members signatures may **not** contain URLs or web links, in *any* form.

- We *will not tolerate* abusive, sexist, racist, or any other derogatory remarks, nor members acting like self-appointed moderators. The forum staff are responsible for moderation, and they're here to help you. Please use their services.
- If ANY member has an issue with the content of ANY post within the forums, use the "**REPORT THIS POST**" button – This is the red triangle icon when using the default forum theme (or the asterisk icon when using the Blackfire Razor forum theme) found in the *top right corner* of each post.
- Breaking the forum rules may incur infractions ranging from loss of posting privileges to a temporary or permanent ban, at the sole discretion of the forum staff.
- These rules are subject to alteration and/or addition. You are responsible for staying aware of any changes.

Kali Linux IRC Channel

Kali Linux has an official IRC channel, **#kali-linux**, on the Freenode network. Please take a few moments to review the rules and guidelines below before joining the channel.

#kali-linux IRC Rules and Guidelines

We try to remain as informal as possible but there *are* some rules and we'd appreciate if you would follow them! Broadly, if you're friendly, tolerant, and reasonable, you'll probably go a long way without any specific knowledge of the rules – but for to avoid any doubt and prevent any misunderstandings, here they are.

How to Treat Other Users

In order to make the channel a pleasant place for all of our users, we expect all to remain as friendly and tolerant as possible. We request that you refrain from profanity and that you show respect to the other channel members and visitors. If you find that you're becoming frustrated with the channel or other users, we encourage you to take a moment to do something else. Try to ensure you don't make people feel like you're just taking advantage of them – help others out while you're waiting for a reply to your questions, and say thanks!

How to Argue

As mentioned above, we'd appreciate it if you'd strive to be friendly and tolerant. We also encourage debates and in-depth discussions about topical subjects. If you choose to participate in one, we expect you to remain as reasonable as possible and employ the skills of logic and critical thinking. These skills will serve you well in discussion, enable you to communicate more efficiently, and spot when others are being less than forthcoming with the truth!

Language

Our IRC channel is an English-speaking channel. There are no other official channels in any other language.

We are a *family-friendly* IRC channel and will not tolerate foul language. Save it for the playground.

Staying on Topic

We maintain no strict policy regarding off-topic chat in the channel however, the discussion of Kali Linux projects is the primary focus of the channel, so you may be asked to take discussions elsewhere, particularly if there are venues on **freenode** better suited to them (such as **#politics**), if there are other more relevant conversations going on, or if they're repetitive or otherwise seen by the channel staff as being detrimental to the good atmosphere of the channel.

Certain things are seen as being specifically off-topic. These topics include:

- **Support or encouragement of illegal activity** – it should go without saying, but we don't exist to help you break the law or do things you shouldn't be doing. Such queries are absolutely off-topic for the channel, for freenode as a whole, and may very well get you removed from the channel and/or network. Please don't ask. Laws vary from country to country and channel OPs may determine whether a specific discussion is appropriate for the channel or not.
- **Warez/cracks/pirated software** – these too are off-topic for the channel and network so again: please don't ask.
- **Political and religious matters** — Many people have very strong political/religious beliefs and we respect that. We also recognize that these are volatile and contentious topics which have nothing to do with Kali Linux, penetration testing, or anything related to those subjects, and are best discussed elsewhere.

Asking for Help

If you're asking for help, first off, thanks! – questions and the resulting discussion of the answer(s) in a collaborative environment are what make IRC great and by helping to add to the atmosphere, you benefit the entire Kali Linux community.

We often find that we learn a lot even from questions we already think we know the answers to – about people, alternative approaches, and cool new resources and tools. However, if you are intending to ask a question, we'd appreciate it if you'd follow a couple useful guidelines to help you, and us, make the best use of our time.

- **Do your research first** — It's very frustrating when people ask a question that can virtually be answered by punching the keywords into a Google search! We also have forums and a wiki that contain answers to many questions we see daily so it's to everyone's benefit if these assets are used before asking in IRC.
- **Give us the whole picture** — If you're asked for more information, please provide it accurately. The correct answer will depend on it. Looking at this from another angle: the more we learn about your problem, the more this independently benefits us too – a large part of the development of new releases comes out of helping others with issues discovered with specific setups; even if you're asking us questions, you can help teach us something too!
- **If you find the answer somewhere else, tell us** – it isn't compulsory, but if you don't get an answer to your question in the channel but you find it elsewhere, consider letting us know! That way, we can help out the next person with a similar question. It also lets people know that you already have an answer you're happy with, or that if anyone's researching the question for you, they can stop.
- **Wait for an answer** – not everyone in the channel is online all the time, and you may find you get an answer several minutes, or even hours, later. Feel free to stick around and chat, or even answer other peoples questions – you'll find it helps pass the time and makes others likely to help you! Help us build a community of friendly security professionals and enthusiasts.

Spam, Flooding, and Various Other Forms of Disruptive Behaviour

Spam, flooding, disrespect or verbal attacks against other users, misleading links, intentionally wrong answers, and other forms of disruptive behaviour not otherwise specified are unwelcome. Disruptive behaviour includes (but is not restricted to) the operation of unauthorized bots in the channel, public logging of the channel, and scripts such as those that publicly announce what track your MP3 player is playing or your away status.

If you have more than 5 lines of text to paste, use pastebin for your data and then paste the URL into channel.

Dealing With the Channel Staff

From time to time, you may be asked to take conversations elsewhere, treat others reasonably, steer a conversation in a particular direction, or a variety of other things in order to preserve the ambiance and usefulness of the channel. If you're the target of such a request, please be as reasonable as you can and if you wish to take issue with it, do so in a private message with the channel staffer in question, rather than making noise in channel.

Discipline

Repeated breaking of the rules will cause channel staffers to mute (+q), ban (+b), kick, or otherwise remove you from the channel. This will particularly apply if you're seen to be willfully ignoring the rules after we've drawn your attention to them.

Many forms of disruptive behaviour, such as flooding or trolling, may result in discipline without a warning. We try and avoid the use of force wherever possible and we'd appreciate it if you'd help us in pursuing this goal!

If you're a bystander while a staffer is forced to use his or her powers for channel management, we'd appreciate your understanding and consideration in awaiting the end of the incident, and your assistance in keeping the situation as favourable as possible by not complaining, commentating, or gloating. This serves to make antisocial behaviour such as flooding less attractive (the smaller the reaction, the less the return on the malfeasance), and so benefits you as well as us!

Thanks for your cooperation and help in making the #kali-linux a more enjoyable, friendlier, and more productive experience for everyone involved.

Official Kali Linux Sites

/07. Kali Community Support /Official Kali Linux Sites

• 07. Kali Community Support

The Kali Linux project uses several different subdomains of kali.org, each with a specific purpose. This article lists the official Kali sites and the purpose each one of them serves. *Note that these sites are the **only** official Kali Linux sites* and are *the only authoritative sources of information* available for the distribution.

The sites listed below are the **ONLY** official outlets for the Kali Linux Distribution.

Public Websites

- **www.kali.org**
- **docs.kali.org**
- **forums.kali.org**
- **bugs.kali.org**
- **git.kali.org**
- **tools.kali.org**
- **pkg.kali.org**

The main Kali Linux website is our primary means of communicating news about the Kali Linux project, general introductory information, and general updates about the project and its ongoing development.
Blog posts about new tools, features, Kali Linux tips, tricks, and tutorials can be found here.
This should be *your one and only source* to download the official Kali Linux distribution.

Social Media

We're on social media — follow us on Twitter, "like" our official Facebook page to keep up with important announcements and news.

- **twitter**
- **facebook**

We don't tweet a lot but when we do, it's important. Information on releases and blog posts will be pushed to our twitter account, @KaliLinux.

Official Kali Linux Mirrors

Using Official Repositories

The Kali Linux distribution has two repositories, which are mirrored world-wide:

- http.kali.org (mirrorlist): the main package repository;
- cdimage.kali.org (mirrorlist): the repository of pre-built Kali ISO images.

When using the default hosts listed above, you'll automatically be redirected to a mirror site which is geographically close to you, and which is guaranteed to be up-to-date. If you prefer to manually select a mirror, click on the ***mirrorlist*** link near each hostname above and select a mirror that suits you. You will then need to edit your `/etc/apt/sources.list` file accordingly with the chosen values.

IMPORTANT! **Do not add** additional repositories to your **/etc/apt/sources.list** file.

Doing so will most likely **break** your Kali installation.

How to Set Up a Kali Linux Mirror

Requirements

To be an official Kali Linux mirror, you will need a web-accessible server **(http required and https if possible too)** with lots of disk space, good bandwidth, rsync, and SSH access enabled. As of early 2015, the main package repository is about 450 GB and the ISO images repository is about 50 GB but you can expect those numbers to grow regularly. A mirror site is expected to make the files available over HTTP and RSYNC so those services will need to be enabled. FTP access is optional.

Note on "Push Mirroring" — The Kali Linux mirroring infrastructure uses SSH-based triggers to ping the mirrors when they need to be refreshed. This currently takes place 4 times a day.

Create a User Account for the Mirror

If you don't have yet an account dedicated for the mirrors, create such an account (here we call it "archvsync"):

```
$ sudo adduser --disabled-password archvsync
Adding user 'archvsync' ...
[...]
Is the information correct? [Y/n]
```

Create Directories for the Mirror

Create the directories that will contain the mirrors and change their owner to the dedicated user that you just created:

```
$ sudo mkdir /srv/mirrors/kali{,-images}
$ sudo chown archvsync:archvsync /srv/mirrors/kali{,-images}
```

Configure rsync

Next, configure the rsync daemon (enable it if needed) to export those directories:

```
$ sudo sed -i -e "s/RSYNC_ENABLE=false/RSYNC_ENABLE=true/" /etc/default/rsync
$ sudo vim /etc/rsyncd.conf
$ cat /etc/rsyncd.conf
uid = nobody
gid = nogroup
max connections = 25
socket options = SO_KEEPALIVE

[kali]
path = /srv/mirrors/kali
comment = The Kali Archive
read only = true

[kali-images]
path = /srv/mirrors/kali-images
comment = The Kali ISO images
read only = true
$ sudo service rsync start
Starting rsync daemon: rsync.
```

Configure Your Mirror

Configuration of your web server and FTP server are outside the scope of this article. Ideally, you should export the mirrors at http://yourmirror.net/kali and http://yourmirror.net/kali-images (and do the same for the FTP protocol, if you're supporting it).

Now comes interesting part: the configuration of the dedicated user that will handle the SSH trigger and the actual mirroring. You should first unpack ftpsync.tar.gz in the user's account:

```
$ sudo su - archvsync
$ wget http://archive.kali.org/ftpsync.tar.gz
$ tar zxf ftpsync.tar.gz
```

Now we need to create a configuration file. We start from a template and we edit at least the *MIRRORNAME*, *TO*, *RSYNC_PATH*, and *RSYNC_HOST* parameters:

```
$ cp etc/ftpsync.conf.sample etc/ftpsync-kali.conf
$ vim etc/ftpsync-kali.conf
$ grep -E '^[^#]' etc/ftpsync-kali.conf
MIRRORNAME=`hostname -f`
TO="/srv/mirrors/kali/"
RSYNC_PATH="kali"
RSYNC_HOST=archive.kali.org
```

Set Up the SSH Keys

The last step is to setup the .ssh/authorized_keys file so that archive.kali.org can trigger your mirror:

```
$ mkdir -p .ssh
$ wget -O - -q http://archive.kali.org/pushmirror.pub >>.ssh/authorized_keys
```

If you have not unpacked the ftpsync.tar.gz in the home directory, then you must adjust accordingly the “~/bin/ftpsync” path, which is hard-coded in .ssh/authorized_keys.

Now you must send an email to devel@kali.org with all the URLs of your mirrors so that you can be added in the main mirror list and to open up your rsync access on archive.kali.org. Please indicate clearly who should be contacted in case of problems (or if changes must be made/coordinated to the mirror setup).

Instead of waiting for the first push from archive.kali.org, you should run an initial rsync with a mirror close to you, using the mirror list linked above to select one. Assuming that you picked archive-4.kali.org, here’s what you can run as your dedicated mirror user:

```
$ rsync -qaH archive-4.kali.org::kali /srv/mirrors/kali/ &
$ rsync -qaH archive-4.kali.org::kali-images /srv/mirrors/kali-images/ &
```

Set Up cron to Manually Mirror ISO Images

The ISO images repository does not use push mirroring so you must schedule a daily rsync run. We provide a bin/mirror-kali-images script, which is ready to use that you can add in the crontab of your dedicated user. You just have to configure etc/mirror-kali-images.conf.

```
$ sudo su - archvsync
$ cp etc/mirror-kali-images.conf.sample etc/mirror-kali-images.conf
```

```
$ vim etc/mirror-kali-images.conf
$ grep -E '^[^#]' etc/mirror-kali-images.conf
TO=/srv/mirrors/kali-images/
$ crontab -e
$ crontab -l
# m h dom mon dow command
39 3 * * * ~/bin/mirror-kali-images
```

Please adjust the precise time so that archive.kali.org doesn't get overloaded by too many mirrors at the same time.

08. Kali Linux Policies(7)

Kali Linux Root User Policy

/08. Kali Linux Policies /Kali Linux Root User Policy
• 08. Kali Linux Policies

Most Linux distributions, quite sensibly, encourage the use of a non-privileged account while running the system and use a utility like `sudo` when and if escalation of privileges in needed. This is sound security advice: this provides an extra layer of protection between the user and any potentially disruptive or destructive operating system commands or operations. This is especially true for multiple user systems, where user privilege separation is a requirement — misbehavior by one user can disrupt or destroy the work of many users.

Kali Linux, however, as a security and auditing platform, contains many which tools can only run with root privileges. Further, Kali Linux's nature makes its use in a multi-user environment highly unlikely.

For these reasons, the default Kali user is "root", and no non-privileged user is created as a part of the installation process. This is one reason that Kali Linux is not recommended for use by Linux beginners who might be more apt to make destructive mistakes while running with root privileges.

Kali Network Service Policies

/08. Kali Linux Policies /Kali Network Service Policies
• 08. Kali Linux Policies

Kali Linux is a penetration testing toolkit, and may potentially be used in "hostile" environments. Accordingly, Kali Linux deals with network services in a very different way than typical Linux distributions. Specifically, Kali *does not enable any externally-listening services by default* with the goal of minimizing exposure when in a default state.

Default Disallow Policy

Kali Linux, as a standard policy, will *disallow network services from persisting across reboots by default*.

The following example can be seen when attempting to install a tool which would by default would start a network proxy service on TCP port 3142:

```
root@kali:~# apt-get install apt-cacher-ng
...
Setting up apt-cacher-ng (0.7.11-1) ...
update-rc.d: We have no instructions for the apt-cacher-ng init script.
update-rc.d: It looks like a network service, we disable it.
...
root@kali:~#
```

Notice how the update-rc.d script disallowed persistence of the apt-cacher-ng daemon by default.

Overriding the Default Policy

In certain situations, you may actually want certain services to persist over reboots. To allow for this, you can enable a service to persist through reboots using the systemctl command as follows:

```
root@kali:~# systemctl enable apt-cacher-ng
Synchronizing state of apt-cacher-ng.service with SysV service script
with /lib/systemd/systemd-sysv-install.
Executing: /lib/systemd/systemd-sysv-install enable apt-cacher-ng
insserv: warning: current start runlevel(s) (empty) of script `apt-cacher-ng' overrides LSB
defaults (2 3 4 5).
insserv: warning: current stop runlevel(s) (0 1 2 3 4 5 6) of script `apt-cacher-ng' overrides LSB
defaults (0 1 6).
```

Service whitelists and blacklists

Service whitelists and blacklists can be found in the **/usr/sbin/update-rc.d** file. You can edit this file to explicitly allow or deny services the ability to automatically start up at boot time.

```
root@kali:~# tail -95 /usr/sbin/update-rc.d |more
...
```

```
__DATA__
#
# List of blacklisted init scripts
#
apache2 disabled
avahi-daemon disabled
bluetooth disabled
cups disabled
dictd disabled
ssh disabled
...
#
# List of whitelisted init scripts
#
acpid enabled
acpi-fakekey enabled
acpi-support enabled
alsa-utils enabled
anacron enabled
...
```

Kali Linux Update Policies

/08. Kali Linux Policies /Kali Linux Update Policies

• 08. Kali Linux Policies

The majority of the packages comprising the Kali Linux distribution are drawn directly from the Debian repositories. For those packages which have been incorporated into Kali Linux “as-is” — i.e. the vast majority — security updates arrive at essentially the same time for Kali Linux as for the main Debian distribution.

Other packages are supported on a best-effort basis by the Kali Linux development team.

Penetration Testing Tools Policy

/08. Kali Linux Policies /Penetration Testing Tools Policy

• 08. Kali Linux Policies

Kali Linux Tools Policy

One of the key tasks in transitioning from Backtrack Linux to Kali was combing through the packages and selecting the “best of breed” from what was available.

We realize that there are many tools or scripts that can do the same job. Some are clearly better than others in some respect, some are more a matter of personal preference. With this in mind, keeping an updated, useful penetration testing tool repository is a challenging task. The Kali Development team uses some of these questions to help decide whether a specific tool should be included in Kali Linux.

- Is the tool useful/functional in a Penetration Testing environment?
    - Does the tool overlap functionality of other existing tools?
    - Does the licensing of the tool allow for free redistribution?
- How much resources does the tool require? Will it work in a “standard” environment?

The answers to questions such as these, among other considerations, help us come to a decision whether the tool should be included in Kali.

Most of the members of the Kali development team are working penetration testers, and we rely on our combined experience and expertise to select the best tools to add the most value to the Kali distribution as we continue its development.

Tools which are specifically aimed at DOS, DDOS or anonymity are *rarely used in legitimate engagements*, and are therefore *not installed by default* in Kali Linux.

New Tool Requests

We are always open to adding new and better tools to our distribution, but we ask that a case be made for each tool. Please put some thought and effort into the tool submission, and please do *not* just send the developers a one line request. Submissions for new tool requests can be made through our Kali Linux bug tracker.

Kali’s Relationship With Debian

The Kali Linux distribution is based on Debian Testing. Therefore, most of the Kali packages are imported, as-is, from the Debian repositories. In some cases, newer packages may be

imported from Debian Unstable or Debian Experimental, either to improve user experience, or to incorporate needed bug fixes.

Forked Packages

In order to implement some of Kali's unique features, we had to fork some packages. The Kali development team strives to keep such packages to a minimum by improving the upstream packages whenever possible, either by integrating the feature directly, or by adding the required hooks so that it's straightforward to enable the desired features without further modifying the upstream packages themselves.

Each package forked by Kali is maintained in a Git repository with a "debian" branch so that updating a forked package can be easily done with a simple *git merge debian* in its master branch.

Additional Packages

Beyond this, Kali incorporates many additional packages which are specific to the penetration testing and security auditing field. The majority of these packages constitute "free software" according to Debian's Free Software Guidelines. Kali intends to contribute those packages back to Debian and to maintain them directly within Debian.

To facilitate this, Kali packaging strives to comply with the Debian Policy and follow the best practices in use in Debian.

Kali Linux Open Source Policy

Kali Linux is a Linux distribution that aggregates thousands of free software packages in its `main` section. As a Debian derivative, all of the core software in Kali Linux complies with the Debian Free Software Guidelines.

As the specific exception to the above, Kali Linux's `non-free` section contains several tools which are not open source, but which have been made available for redistribution by Offensive Security through default or specific licensing agreements with the vendors of those tools.

If you want to build a Kali derivative, you should *review the license* of each Kali-specific non-free package before including it in your distribution — but note that non-free packages which are imported from Debian are safe to redistribute.

More importantly, all of the specific developments in Kali Linux's infrastructure or its integration with the included software have been put under the GNU GPL.

If you want more information about the license of any given piece of software, you can either check `debian/copyright` in the source package or `/usr/share/doc/`*`package`*`/copyright` for a package that you have already installed.

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09. The Kali Linux Dojo(3)

02 – Building Custom Kali ISOs

/09. The Kali Linux Dojo /02 – Building Custom Kali ISOs
• 09. The Kali Linux Dojo

Building Custom Kali ISOs

One of the most powerful features of Kali Linux is the ability to create your own flavors of the distribution containing customized tools, desktop managers, and services. This workshop will show you how to create your own personalized Kali Linux ISO, customizing virtually every aspect using the live-build utility and making efficient use of the various meta-packages available in Kali.

The Awesomeness of Live Build

0x00 – Begin by updating the repos, installing the prerequisites, and checking out a fresh version of live-build-config from the Kali Git repositories:

```
apt update
apt install git live-build cdebootstrap devscripts -y
git clone git://git.kali.org/live-build-config.git
cd live-build-config
```

0x01 – Overwrite the default Kali package list, including only the packages you want. In the video, we simply edited the list and changed a few package names.

```
cat > kali-config/variant-default/package-lists/kali.list.chroot << EOF
kali-root-login
kali-defaults
kali-menu
kali-debtags
kali-archive-keyring
debian-installer-launcher
alsa-tools
locales-all
dconf-tools
openssh-server
EOF
```

0x02 – Add a customised syslinux boot entry which includes a boot parameter for a custom preseed file.

```
cat << EOF > kali-config/common/includes.binary/isolinux/install.cfg
label install
    menu label ^Install Automated
    linux /install/vmlinuz
    initrd /install/initrd.gz

append vga=788 -- quiet file=/cdrom/install/preseed.cfg locale=en_US keymap=us hostname=k
ali domain=local.lan
EOF
```

0x03 – Customise the ISO build. In this example, we'll have the SSH service start by default. To do this, we can use a chroot hook script which is placed in the "hooks" directory:

```
echo 'systemctl enable ssh' >>  kali-config/common/hooks/01-start-ssh.chroot
chmod +x kali-config/common/hooks/01-start-ssh.chroot
```

0x04 – Next, we download a wallpaper and overlay it. Notice how chroot overlayed files are placed in the *includes.chroot* directory.

```
mkdir -p kali-config/common/includes.chroot/usr/share/wallpapers/kali/contents/images
wget https://www.kali.org/dojo/bh2015/wp-blue.png
mv wp-blue.png kali-config/common/includes.chroot/usr/share/wallpapers/kali/contents/
images
```

0x05 – Add a preseed file that will run through a default Kali installation with no input (unattended). We can include a ready made preseed configuration and alter it as needed:

```
mkdir -p kali-config/common/debian-installer
wget https://raw.githubusercontent.com/offensive-security/kali-linux-preseed/master/kali-linux-full-unattended.preseed -O kali-config/common/debian-installer/preseed.cfg
```

0x06 – Let's include a Nessus Debian package into the *packages* directory for inclusion into our final build. Since we used a 64 bit build, we're including a 64 bit Nessus Debian package. Download the Nessus .deb file and place it in the packages.chroot directory:

```
mkdir kali-config/common/packages.chroot
mv Nessus-*amd64.deb kali-config/common/packages.chroot/
```

0x07 – Now you can proceed to build your ISO, this process may take a while depending on your hardware and internet speeds. Once completed, your ISO can be found in the live-build root directory.

```
./build.sh -v
```

For more live-build implementations, refer to the following:

- http://www.offensive-security.com/kali-linux/kali-linux-recipes/
- https://github.com/offensive-security/kali-linux-recipes

03 – Kali Linux USB Persistence

/09. The Kali Linux Dojo /03 – Kali Linux USB Persistence
• 09. The Kali Linux Dojo

USB Persistence & Encrypted Persistence

In this workshop, we will examine the various features available to us when booting Kali Linux from USB devices. We will explore features such as persistence, creating LUKS encrypted persistence stores, and even dabble in "LUKS Nuking" our USB drive. The default Kali Linux ISOs (from 1.0.7 onwards) support USB encrypted persistence.

0x01 – Start by imaging the Kali ISO onto your USB stick (ours was /dev/sdb). Once done, you can inspect the USB partition structure using *parted /dev/sdb print*.

```
dd if=kali-linux-2016.2-amd64.iso of=/dev/sdb bs=1M
```

0x02 – Create and format an additional partition on the USB stick. In our example, we create a persistent partition of about 7 GB in size:

```
root@kali:~# parted
GNU Parted 2.3
Using /dev/sda
Welcome to GNU Parted! Type 'help' to view a list of commands.

(parted) print devices
/dev/sda (480GB)
/dev/sdb (31.6GB)

(parted) select /dev/sdb
Using /dev/sdb

(parted) print
Model: SanDisk SanDisk Ultra (scsi)
Disk /dev/sdb: 31.6GB
Sector size (logical/physical): 512B/512B
Partition Table: msdos

Number  Start   End     Size    Type     File system  Flags
 1      32.8kB  2988MB  2988MB  primary               boot, hidden
 2      2988MB  3050MB  64.9MB  primary  fat16

(parted) mkpart primary 3050 10000
(parted) quit
Information: You may need to update /etc/fstab.
```

0x04 – Encrypt the partition with LUKS:

```
cryptsetup --verbose --verify-passphrase luksFormat /dev/sdb3
```

0x05 – Open the encrypted partition:

```
cryptsetup luksOpen /dev/sdb3 my_usb
```

0x06 – Create an ext3 filesystem and label it.

```
mkfs.ext3 /dev/mapper/my_usb
e2label /dev/mapper/my_usb persistence
```

0x07 – Mount the partition and create your persistence.conf so changes persist across reboots:

```
mkdir -p /mnt/my_usb
mount /dev/mapper/my_usb /mnt/my_usb
echo "/ union" > /mnt/my_usb/persistence.conf
umount /dev/mapper/my_usb
cryptsetup luksClose /dev/mapper/my_usb
```

Now your USB stick is ready to plug in and reboot into Live USB Encrypted Persistence mode.

Multiple Persistence Stores

At this point we should have the following partition structure:

```
root@kali:~# parted /dev/sdb print
```

We can add additional persistence stores to the USB drive, both encrypted or not…and choose which persistence store we want to load, at boot time. Let's create one more additional non-encrypted store. We'll label and call it "work".

0x01 – Create an additional, 4th partition which will hold the "work" data. We'll give it another 5GB of space.

```
root@kali:~# parted /dev/sdb
GNU Parted 2.3
Using /dev/sdb
Welcome to GNU Parted! Type 'help' to view a list of commands.
(parted) print
Model: SanDisk SanDisk Ultra (scsi)
Disk /dev/sdb: 31.6GB
Sector size (logical/physical): 512B/512B
Partition Table: msdos

Number  Start   End     Size    Type     File system  Flags
 1      32.8kB  2988MB  2988MB  primary               boot, hidden
 2      2988MB  3050MB  64.9MB  primary  fat16
 3      3050MB  10.0GB  6947MB  primary

(parted) mkpart primary 10000 15000
(parted) quit
Information: You may need to update /etc/fstab.
```

0x02 – Format the fourth partition, label it "work".

```
mkfs.ext3 /dev/sdb4
e2label /dev/sdb4 work
```

0x03 – Mount this new partition and create a persistence.conf in it:

```
mkdir -p /mnt/usb
mount /dev/sdb4 /mnt/usb
echo "/ union" > /mnt/usb/persistence.conf
umount /mnt/usb
```

Boot the computer, and set it to boot from USB. When the boot menu appears, edit the persistence-label parameter to point to your preferred persistence store!

Emergency Self Destruction of Data in Kali

As penetration testers, we often need to travel with sensitive data stored on our laptops. Of course, we use full disk encryption wherever possible, including our Kali Linux machines, which tend to contain the most sensitive materials.

```
root@kali:~# cryptsetup luksAddNuke /dev/sdb3
Enter any existing passphrase:
Enter new passphrase for key slot:
```

Now dump the keyslots to see the changes:

```
root@kali:~# cryptsetup luksDump /dev/sda5
Device /dev/sda5 doesn't exist or access denied.
root@kali:~# cryptsetup luksDump /dev/sdb3
LUKS header information for /dev/sdb3

Version:        1
Cipher name:    aes
Cipher mode:    xts-plain64
Hash spec:      sha1
Payload offset: 4096
MK bits:        256
MK digest:      f7 17 b9 a7 9f 7f 9b 21 f2 b9 40 78 c2 97 f5 f0 c2 bb 28 8b
MK salt:        f5 a4 80 02 e7 21 0d 7e 5a 64 f4 96 78 a3 15 3c
                09 7b 3f 41 80 2b 5c bf c5 de 92 70 69 bb 34 b2
MK iterations:  64500
UUID:           96793acb-c2d3-45b7-aed9-1af952386556
```

```
Key Slot 0: ENABLED
Iterations:             258064
Salt:                   df 3c d6 03 4a 78 ce ef 62 fd f1 56 25 d4 c5 96
                        2a 12 bb 94 4b d7 cf c1 0a b5 27 47 09 ae 31 46
Key material offset:    8
AF stripes:             4000
Key Slot 1: ENABLED
Iterations:             259108
Salt:                   30 07 ff ef fc f5 74 65 04 f7 66 87 77 f1 74 4f
                        7d 2f 76 e2 71 e7 6a 9c 6d c1 c1 7b 80 53 cb c1
Key material offset:    264
AF stripes:             4000
Key Slot 2: DISABLED
Key Slot 3: DISABLED
Key Slot 4: DISABLED
Key Slot 5: DISABLED
Key Slot 6: DISABLED
Key Slot 7: DISABLED
root@kali:~#
```

Backup you LUKS keyslots and encrypt them:

```
cryptsetup luksHeaderBackup --header-backup-file luksheader.back /dev/sdb3
openssl enc -d -aes-256-cbc -in luksheader.back.enc -out luksheader.back
```

Now boot into your encrypted store, and give the Nuke password, rather than the real decryption password. This will render any info on the encrypted store useless. Once this is done, verify that the data is indeed inacessible.

Lets restore the data now. We'll decrypt our backup of the LUKS keyslots, and restore them to the encrypted partition:

```
openssl enc -d -aes-256-cbc -in luksheader.back.enc -out luksheader.back
cryptsetup luksHeaderRestore --header-backup-file luksheader.back /dev/sdb3
```

Our slots are now restored. All we have to do is simply reboot and provide our normal LUKS password and the system is back to its original state.

04 – Raspberry Pi Disk Encryption

With the advent of smaller, faster ARM hardware such as the new **Raspberry Pi 2 (or even 3!)** (which now has a Kali image built for it), we've been seeing more and more use of these small devices as "**throw-away hackboxes**". While this might be a new and novel technology, **there's one major drawback** to this concept – and that is the **confidentiality of the data**stored on the device itself. Most of the setups we've seen do little to protect the sensitive information saved on the SD cards of these little computers. This fact, together with a nudge from friends is what prompted us to create a LUKS encrypted, NUKE capable Kali Linux image for our Raspberry Pi devices. The following article describes the process, so you can repeat it and make your own shiny shiny.

Birds Eye View of the Disk Encryption Process

The process described below was tried and **tested successfully on a Raspberry Pi B+ and a Raspberry Pi 2/3** (henceforth collectively called "RPi"). but it should be trivial to port these instructions to any ARM device running Kali. Before we begin, let's take a minute to quickly describe what we'll be doing – as while this process is not complicated, it **is involved**. This is basically our spiel:

1. We download the required Kali RPi image and **dd** it to an SD card.
2. We chroot to the RPi image and install/update several files in preparation for our crypted boot.
3. We create an initramfs file which includes Dropbear and freshly generated SSH keys.
4. We rsync the modified rootfs to a temporary backup location and then delete the rootfs partition from the SD card.
5. We then recreate an encrypted partition to which we restore the root partition data. That's it!

If all goes well, the RPi will boot and then LUKS will kick in and ask for a password to decrypt the root drive, while simultaneously opening a Dropbear SSH session through which **you can SSH in and provide the boot decryption password**. Oh yeah, did we mention this image also has **LUKS NUKE capabilities**?

Getting Your Hands Dirty

As always, all our ARM dev is done on a Kali amd64 machine and we've made sure that we have all the dependencies we need. We download the latest Kali RPi3 image (2017.1), extract it, and **dd** it to our SD card, which in our case showed up as /dev/sdb2 – adapt as necessary!

```
dd if=/root/kali-2017.3-rpi3.img of=/dev/sdb bs=4M
```

Once dd'd, we mount the various partitions and chroot into the Kali RPi3 image:

```
mkdir -p /mnt/chroot/boot

mount /dev/sdb2 /mnt/chroot/
mount /dev/sdb1 /mnt/chroot/boot/

mount -t proc none /mnt/chroot/proc
mount -t sysfs none /mnt/chroot/sys
mount -o bind /dev /mnt/chroot/dev
mount -o bind /dev/pts /mnt/chroot/dev/pts
apt-get install qemu-user-static

cp /usr/bin/qemu-arm-static /mnt/chroot/usr/bin/
LANG=C chroot /mnt/chroot/
```

We then update our image and install some essential packages we will need for this process:

```
apt-get update
apt-get install busybox cryptsetup dropbear-initramfs
```

We create an initial initramfs file, which will trigger the dropbear SSH key generation. We first find out the modules directory version number as follows (this will change between different image versions and Kali releases):

```
root@kali:/# ls -l /lib/modules/ |awk -F" " '{print $9}'
4.9.59-Re4son-Kali-Pi+
```

We then use that version info to generate an initial initramfs file.

```
mkinitramfs -o /boot/initramfs.gz 4.9.59-Re4son-Kali-Pi+
```

We change the default root password.

```
passwd
```

Next, we modify the boot parameters in cmdline.txt and config.txt.

```
nano /boot/cmdline.txt
```

…and add / change the following parameters:

```
root=/dev/mapper/crypt_sdcard cryptdevice=/dev/mmcblk0p2:crypt_sdcard rootfstype=ext4
```

Next create or add to /boot/config.txt:

```
echo initramfs initramfs.gz >> /boot/config.txt
```

Now we deal with the Dropbear SSH access. We copy over SSH private key from our laptop, or, create one specifically for doing this:

Copying:

```
cp /root/.ssh/id_rsa.pub /etc/dropbear-initramfs/authorized_keys
chmod 0600 /etc/dropbear-initramfs/authorized_keys
```

Creating (on the host machine, **NOT** in the chroot:

```
ssh-keygen -N "" -f kali-luks-unlock
cat kali-luks-unlock.pub > /mnt/chroot/etc/dropbear-initramfs/authorized_keys
chmod 0600 /mnt/chroot/etc/dropbear-initramfs/authorized_keys
```

And limit the SSH connection to allow interaction with the cryptroot application only.

```
nano /etc/dropbear-initramfs/authorized_keys
```

We paste the following **before** the ssh public key begins.

```
command="/scripts/local-top/cryptroot && kill -9 `ps | grep -m 1 'cryptroot' | cut -d ' ' -f 3`"
```

Then to ensure we get cryptsetup in the initramfs, we edit the cryptsetup initramfs hook.

```
echo "CRYPTSETUP=y" >> /etc/cryptsetup-initramfs/conf-hook
```

We then edit fstab and crypttab with our configured boot device and exit the chroot:

```
cat > /etc/fstab <<EOF
proc /proc proc defaults 0 0
/dev/mmcblk0p1 /boot vfat defaults 0 2
/dev/mapper/crypt_sdcard / ext4 defaults,noatime 0 1
EOF
```

```
echo crypt_sdcard /dev/mmcblk0p2 none luks > /etc/crypttab
```

During our tests, we noticed that in some instances, the USB ports take a while to wake up, which can kill the initrd Dropbear network initialization. To fix this, we introduce a 5-second sleep in the configure_networking function located in the initrd itself:

```
nano /usr/share/initramfs-tools/scripts/functions
```

change:

```
configure_networking()
{
...
```

to:

```
configure_networking()
{

echo "Waiting 5 seconds for USB to wake"
sleep 5
...
```

Note: Do NOT add the "…" they are a placeholder to mean there is more stuff there, that we aren't editing.

Save the file then regenerate the initramfs and exit the chroot. You can ignore the cryptsetup and device-mapper warnings.

```
mkinitramfs -o /boot/initramfs.gz 4.9.59-Re4son-Kali-Pi+
exit
```

Now we proceed to tear down the chroot and backup our rootfs partition:

```
umount /mnt/chroot/boot
umount /mnt/chroot/sys
umount /mnt/chroot/proc
umount /mnt/chroot/dev/pts
umount /mnt/chroot/dev
mkdir -p /mnt/backup
rsync -avh /mnt/chroot/* /mnt/backup/
```

Once the backup is done, we unmount everything:

```
umount /mnt/chroot
```

Now we delete the existing 2nd partition on the SD card and recreate an empty one, which we will set up for LUKS encryption.

```
echo -e "d\n2\nw" | fdisk /dev/sdb
echo -e "n\np\n2\n\n\nw" | fdisk /dev/sdb
```

Unplug your SD card and plug it back in to have the new partitions register, then start setting up your encrypted partition.

```
cryptsetup -v -y --cipher aes-xts-plain64 --key-size 256 luksFormat /dev/sdb2
cryptsetup -v luksOpen /dev/sdb2 crypt_sdcard
mkfs.ext4 /dev/mapper/crypt_sdcard
```

Once ready, we restore the rootfs backup to the now encrypted partition.

```
mkdir -p /mnt/encrypted
mount /dev/mapper/crypt_sdcard /mnt/encrypted/
rsync -avh /mnt/backup/* /mnt/encrypted/
umount /mnt/encrypted/
rm -rf /mnt/backup
sync
```

Then we unmount and close the volume.

```
cryptsetup luksClose /dev/mapper/crypt_sdcard
```

That’s it!

Now all that remains is to boot up the RPi using the modified SD card. The initramfs will load Dropbear and get a DHCP address on your local LAN (you can also hardcode an IP), allowing you to SSH to the booting RPi and enter a decryption password. Once the password is accepted, Dropbear will exit and the RPi will continue to boot. You should see something like the following:

```
root@kali:~# ssh -i key 192.168.13.37
The authenticity of host '192.168.13.37 (192.168.13.37)' can't be established.
RSA key fingerprint is a6:a2:ad:7d:cb:d8:70:58:d1:ed:81:e8:4a:d5:23:3a.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '192.168.13.37' (RSA) to the list of known hosts.
Unlocking the disk /dev/mmcblk0p2 (crypt_sdcard)
Enter passphrase: cryptsetup: crypt_sdcard set up successfully
Connection to 192.168.13.37 closed.
root@kali:~#
```

Can I Have Some LUKS NUKE With That Pi?

If you are not familiar with the [Kali Linux LUKS NUKE] (https://www.kali.org/how-to/nuke-kali-linux-luks/) feature then you’re missing out. Although this stage is optional, it allows you to configure and apply an emergency self-destruct password to your LUKS encrypted drive. To do this, we simply define a Nuke password on our encrypted partition:

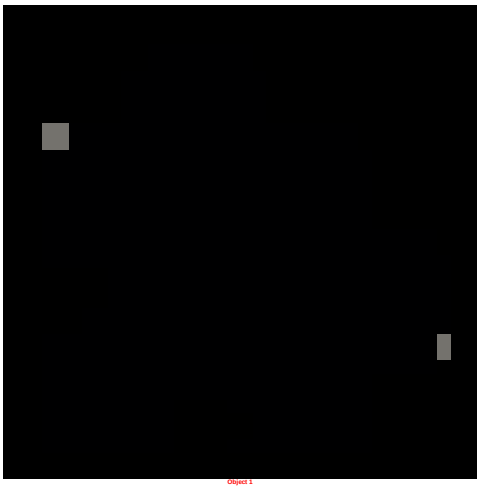
```
root@kali:~# cryptsetup luksAddNuke /dev/sdb2
Enter any existing passphrase: (existing passphrase)
Enter new passphrase for key slot: (new nuke passphrase)
root@kali:~#
```

With the Nuke password defined, you can now remotely wipe the LUKS decryption keyslots, making the data on the SD card inaccessible.

Raspberry Pi Disk Encryption Video

In order to give a bit more visual context to the process, we made a short video which shows the sequence of commands used to get LUKS disk encryption working on a Raspberry Pi B+. Enjoy!

Setting up LUKS disk encryption on a Raspberry Pi running Kali Linux. Also supports LUKS Nuke features!



Kali Dojo 04 – Kali on a Raspberry Pi with LUKS Disk Encryption from Offensive Security.

References

We came up with this procedure by cannibalising ideas and instructions from various sources on the net, most notably, the two below. Big thanks to the Raspberry Pi community!

1. https://www.ofthedeed.org/posts/Encrypted_Raspberry_Pi/
2. http://www.raspberrypi.org/forums/viewtopic.php?f=28&t=7626

KALI LINUX COMMANDS

A-Z of Kali Linux commands are here below:

All Kali Linux Commands

Here below we are listing A-Z Kali Linux commands which will help you to ease of flow in work.

Kali Linux commands	Function
A	
apropos	Search Help manual pages (man -k)
apt-get	Search for and install software packages (Debian)
aptitude	Search for and install software packages (Debian)
aspell	Spell Checker
awk	Find and Replace text, database sort/validate/index
B	
basename	Strip directory and suffix from filenames
bash	GNU Bourne-Again Shell
bc	Arbitrary precision calculator language
bg	Send to background
break	Exit from a loop
builtin	Run a shell builtin
bzip2	Compress or decompress named files
C	
cal	Display a calendar
case	Conditionally perform a command
cat	Concatenate and print (display) the content of files
cd	Change Directory
cfdisk	Partition table manipulator for Linux
chgrp	Change group ownership
chmod	Change access permissions
chown	Change file owner and group
chroot	Run a command with a different root directory
chkconfig	System services (runlevel)
cksum	Print CRC checksum and byte counts
clear	Clear terminal screen
cmp	Compare two files
comm	Compare two sorted files line by line
command	Run a command – ignoring shell functions
continue	Resume the next iteration of a loop
cp	Copy one or more files to another location

cron	Daemon to execute scheduled commands
crontab	Schedule a command to run at a later time
csplit	Split a file into context-determined pieces
cut	Divide a file into several parts
D	
date	Display or change the date and time
dc	Desk Calculator
dd	Convert and copy a file, write disk headers, boot records
ddrescue	Data recovery tool
declare	Declare variables and give them attributes
df	Display free disk space
diff	Display the differences between two files
diff3	Show differences among three files
dig	DNS lookup
dir	Briefly list directory contents
dircolors	Colour setup for `ls’
dirname	Convert a full pathname to just a path
dirs	Display list of remembered directories
dmesg	Print kernel & driver messages
du	Estimate file space usage
E	
echo	Display message on screen
egrep	Search files for lines that match an extended expression
eject	Eject removable media
enable	Enable and disable builtin shell commands
env	Environment variables
ethtool	Ethernet card settings
eval	Evaluate several commands/arguments
exec	Execute a command
exit	Exit the shell
expect	Automate arbitrary applications accessed over a terminal
expand	Convert tabs to spaces
export	Set an environment variable
expr	Evaluate expressions
F	
false	Do nothing, unsuccessfully
fdformat	Low-level format a floppy disk
fdisk	Partition table manipulator for Linux
fg	Send job to foreground
fgrep	Search files for lines that match a fixed string
file	Determine file type
find	Search for files that meet a desired criteria

fmt	Reformat paragraph text
fold	Wrap text to fit a specified width
for	Expand words, and execute commands
format	Format disks or tapes
free	Display memory usage
fsck	File system consistency check and repair
ftp	File Transfer Protocol
function	Define Function Macros
fuser	Identify/kill the process that is accessing a file
G	
gawk	Find and Replace text within files
getopts	Parse positional parameters
grep	Search files for lines that match a given pattern
groupadd	Add a user security group
groupdel	Delete a group
groupmod	Modify a group
groups	Print group names a user is in
gzip	Compress or decompress named files
H	
hash	Remember the full pathname of a name argument
head	Output the first part of files
help	Display help for a built-in command
history	Command History
hostname	Print or set system name
I	
iconv	Convert the character set of a file
id	Print user and group id’s
if	Conditionally perform a command
ifconfig	Configure a network interface
ifdown	Stop a network interface
ifup	Start a network interface up
import	Capture an X server screen and save the image to file
install	Copy files and set attributes
J	
jobs	List active jobs
join	Join lines on a common field
K	
kill	Stop a process from running
killall	Kill processes by name
L	
less	Display output one screen at a time
let	Perform arithmetic on shell variables
ln	Create a symbolic link to a file

local	Create variables
locate	Find files
logname	Print current login name
logout	Exit a login shell
look	Display lines beginning with a given string
lpc	Line printer control program
lpr	Off line print
lprint	Print a file
lprintd	Abort a print job
lprintq	List the print queue
lprm	Remove jobs from the print queue
ls	List information about files
lsof	List open files
M	
make	Recompile a group of programs
man	Help manual
mkdir	Create new folders
mkfifo	Make FIFOs (named pipes)
mkisofs	Create an hybrid ISO9660/JOLIET/HFS filesystem
mknod	Make block or character special files
more	Display output one screen at a time
mount	Mount a file system
mtools	Manipulate MS-DOS files
mtr	Network diagnostics (traceroute/ping)
mv	Move or rename files or directories
mmv	Mass Move and rename files
N	
netstat	Networking information
nice	Set the priority of a command or job
nl	Number lines and write files
nohup	Run a command immune to hangups
notify-send	Send desktop notifications
nslookup	Query Internet name servers interactively
O	
open	Open a file in its default application
op	Operator access
P	
passwd	Modify a user password
paste	Merge lines of files
pathchk	Check file name portability
ping	Test a network connection
pkill	Stop processes from running

popd	Restore the previous value of the current directory
pr	Prepare files for printing
printcap	Printer capability database
printenv	Print environment variables
printf	Format and print data
ps	Process status
pushd	Save and then change the current directory
pwd	Print Working Directory
Q	
quota	Display disk usage and limits
quotacheck	Scan a file system for disk usage
quotactl	Set disk quotas
R	
ram	ram disk device
rcp	Copy files between two machines
read	Read a line from standard input
readarray	Read from stdin into an array variable
readonly	Mark variables/functions as readonly
reboot	Reboot the system
rename	Rename files
renice	Alter priority of running processes
remsync	Synchronize remote files via email
return	Exit a shell function
rev	Reverse lines of a file
rm	Remove files
rmdir	Remove folders
rsync	Remote file copy (Synchronize file trees)
S	
screen	Multiplex terminal, run remote shells via ssh
scp	Secure copy (remote file copy)
sdiff	Merge two files interactively
sed	Stream Editor
select	Accept keyboard input
seq	Print numeric sequences
set	Manipulate shell variables and functions
sftp	Secure File Transfer Program
shift	Shift positional parameters
shopt	Shell Options
shutdown	Shutdown or restart linux
sleep	Delay for a specified time
slocate	Find files
sort	Sort text files

source	Run commands from a file
split	Split a file into fixed-size pieces
ssh	Secure Shell client (remote login program)
strace	Trace system calls and signals
su	Substitute user identity
sudo	Execute a command as another user
sum	Print a checksum for a file
suspend	Suspend execution of this shell
symlink	Make a new name for a file
sync	Synchronize data on disk with memory
T	
tail	Output the last part of file
tar	Tape Archiver
tee	Redirect output to multiple files
test	Evaluate a conditional expression
time	Measure Program running time
times	User and system times
touch	Change file timestamps
top	List processes running on the system
traceroute	Trace Route to Host
trap	Run a command when a signal is set(bourne)
tr	Translate, squeeze, and/or delete characters
true	Do nothing, successfully
tsort	Topological sort
tty	Print filename of terminal on stdin
type	Describe a command
U	
ulimit	Limit user resources
umask	Users file creation mask
umount	Unmount a device
unalias	Remove an alias
uname	Print system information
unexpand	Convert spaces to tabs
uniq	Uniquify files
units	Convert units from one scale to another
unset	Remove variable or function names
unshar	Unpack shell archive scripts
until	Execute commands (until error)
uptime	Show uptime
useradd	Create new user account
usermod	Modify user account

users	List users currently logged in
uuencode	Encode a binary file
uudecode	Decode a file created by uuencode
v	
v	Verbosely list directory contents (`ls -l -b’)
vdir	Verbosely list directory contents (`ls -l -b’)
vi	Text Editor
vmstat	Report virtual memory statistics
w	
wait	Wait for a process to complete
watch	Execute/display a program periodically
wc	Print byte, word, and line counts
whereis	Search the user’s $path, man pages and source files for a program
which	Search the user’s $path for a program file
while	Execute commands
who	Print all usernames currently logged in
whoami	Print the current user id and name (`id -un’)
wget	Retrieve web pages or files via HTTP, HTTPS or FTP
write	Send a message to another user
x	
xargs	Execute utility, passing constructed argument lists
xdg-open	Open a file or URL in the user’s preferred application
y	
yes	Print a string until interrupted

Now you know all Kali Linux commands and for future reference we also included a Kali commands PDF for you. Print it out to guide through Kali Linux while your offline.